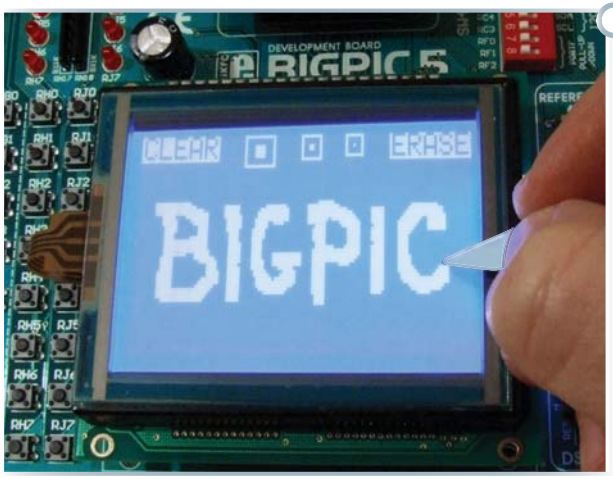
MikroElektronika

SOFTWARE AND HARDWARE SOLUTIONS FOR EMBEDDED WORLD . . . making it simple

BIGPIC5



USER'S MANUAL

With useful implemented peripherals, plentiful practical code examples and a broad set of add-on boards (Serial Ethernet, Compact Flash, MMC/SD, etc.), MikroElektronika development boards make fast and reliable tools that can satisfy the needs of experienced engineers and beginners alike.

USB 2.0 IN-CIRCUIT PROGRAMMER

TOUCH SCREEN

mikro ICD IN-CIRCUIT DEBUGGER

TO OUR VALUED CUSTOMERS

I want to express my thanks to you for being interested in our products and having confidence in MikroElektronika.
It is our intention to provide you with the best quality products. Furthermore, we will continue to improve our performance to better suit your needs.

Nebojša Matić
General Manager

DISCLAIMER:
All products are owned by MikroElektronika and protected by copyright law and international copyright treaty. Therefore, you should treat this manual as any other copyright material. The manual and products may not be copied, partially or as a whole
without written consent of MikroElektronika. Manual PDF – edition can be printed for private or local use, but not for distribution. Modifying manuals or products is prohibited.

HIGH RISK ACTIVITIES
The products of MikroElektronika are not fault – tolerant and nor designed, manufactured or intended for use or resale as on – line control equipment in hazardous environments requiring fail – safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, direct life support machines or weapons systems in which the failure of Software could lead directly to death, personal injury or severe physical or environmental damage ("High Risk Activities"). MikroElektronika and its suppliers specifically disclaim any expressed or implied warranty of fitness for High Risk Activities.

LICENSE AGREEMENT:
By using our products you agree to be bound by all terms of this agreement. Copyright by MikroElektronika 2003 – 2008.

PIC, PICmicro and MPLAB are registered trademarks of Microchip Company. Windows is a registered trademark of Microsoft Corporation. All other trade and/or service marks are the property of the respective owners.

CONTENTS

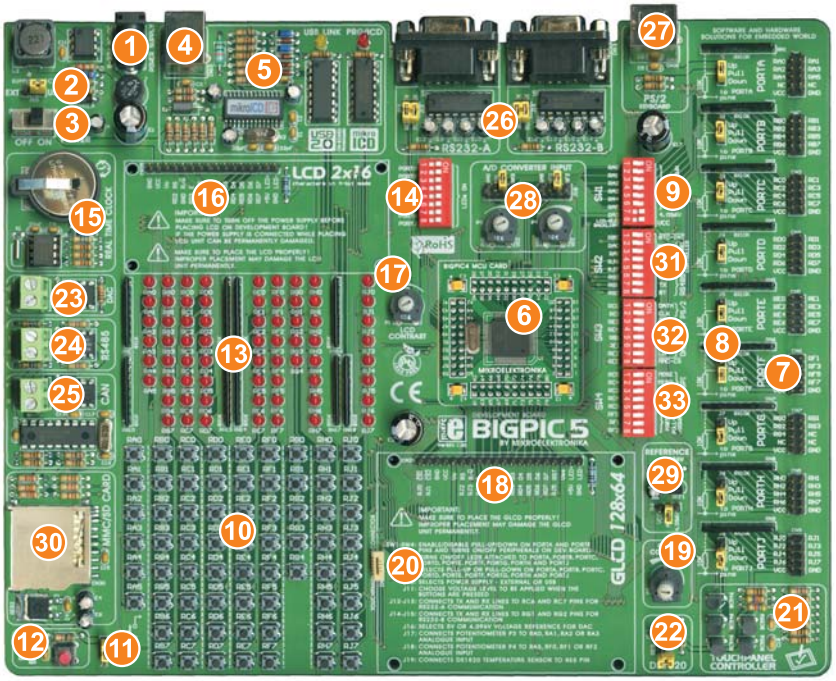
BigPIC5 KEY FEATURES 4
CONNECTING THE SYSTEM 5
INTRODUCTION 6

Switches 7
Jumpers 8
MCU Card 9
MCU Ports 11
Power Supply 12
On-board USB 2.0 Programmer 13
MikroICD (Hardware In-Circuit Debugger) 14
LEDs 15
Push Buttons 17
2x16 Character LCD 20
Graphic LCD 21
Touch Panel 22
RS-232 Communication 23
PS/2 Communication 26
DS1820 Digital Thermometer 27
A/D Converter Input 28
Direct Port Access 30
MMC/SD (Multimedia Card) 32
CAN Communication 34
RS485 Communication 35
D/A Converter 36
Real Time Clock 37

SOFTWARE AND HARDWARE SOLUTIONS FOR EMBEDDED WORLD

MikroElektronika

BigPIC5
KEY FEATURES



1. External power supply of 8v to 16v AC/DC.
2. Selectable external and USB power supply. When using USB port, there is no need for external power supply.
3. Power on/off switch.
4. USB connector.
5. Very fast and flexible on-board USB programmer with mikroICD (In-Circuit Debugger). Its key feature is ability to upgrade. By downloading a new software, it will be possible to program new MCUs in coming years.
6. MCU Card supports all 64 and 80 pin PIC MCUs.
7. Direct port access connectors.
8. Jumpers to determine input pin performance in idle state (connected to pull-up or pull-down resistor).
9. Switch group SW1 enables pull-up/pull-down resistors on PORTA pins RA0-RA5, reference voltage for MCUs A/D converter and LCD/GLCD backlight.
10. 67 push-buttons allow control of all the microcontroller pins.
11. Jumper to select high or low state of pins on push-button press.
12. RESET push-button.
13. Each I/O pin corresponds to one LED.
14. Switch group SW5 allows all LEDs on ports A, B, C, D, E, F, G, H and J to be connected or disconnected from MCU pins.
15. On-board real-time clock/calendar.
16. 16x2 characters LCD display connector.
17. Potentiometer for LCD contrast adjustment.
18. Graphic LCD display (GLCD) connector.
19. Potentiometer for GLCD contrast adjustment.
20. Touch panel connector.
21. Touch panel controller.
22. DS1820 temperature sensor allows temperature measurement with 0.5 C accuracy.
23. 12-bit D/A connector.
24. RS-485 communication module.
25. CAN communication module.
26. Two RS232 communication ports- RS232 A and RS232 B.
27. PS/2 keyboard connector.
28. For testing purposes, several pins on PORTA and PORTF can be connected to potentiometers P3 and P4 and as such can be used as inputs for measurement variable voltages set by these potentiometers.
29. Precise 4.096V voltage reference.
30. MMC/SD slot for multimedia cards with up to 2GB storage space.
31. Switch group SW2 enables real-time clock alarm signal, touch panel controller and RS-485 controller.
32. Switch group SW3 enables PS/2 keyboard connection, CAN communication, D/A converter and MMC/SD card.
33. Switch group SW4 enables SPI and I^2C communication module and pull-up/pull-down resistors on some PORTF pins.

CONNECTING THE SYSTEM

Apart from this manual, development system box contains development system, product CD, USB cable, RS232 cable and user's manuals for *PICflash programmer, mikroICD Debugger* and *Installing USB drivers*. In order to use BigPIC5 properly, it is necessary to go through the following steps:

Step no.1 Take development system and product CD out of the box. First of all, insert the product CD into CD drive. Do not connect development system to PC yet.

Step no.2 Install PICflash programmer software to enable a program to be transferred from PC to the microcontroller chip. Installation instructions are contained in '*PICflash programmer*' manual.

Step no.3 Install USB drivers on your PC to enable programmer's hardware to operate properly on BigPIC5 board. For detailed installation instructions refer to '*Installing USB drivers*' manual.

Step no.4 Connect BigPIC5 to PC using USB cable. Please use one of USB ports on the back of the PC because they are directly connected to the computer motherboard.
The first time you switch the BigPIC5 on, your PC will automatically detect a new hardware. You will be immediately prompted whether Windows should search for new drivers update or not. Select the option '*No, not this time*' and click '*Next*'. Another window appears, click 'Next' and the operating system will automatically find the drivers. Click '*Finish*' to complete this process and run PICflash as explained in '*PICflash programmer*' manual. Next time you switch the BigPIC5 on, Windows will not ask for new drivers update during driver installation.

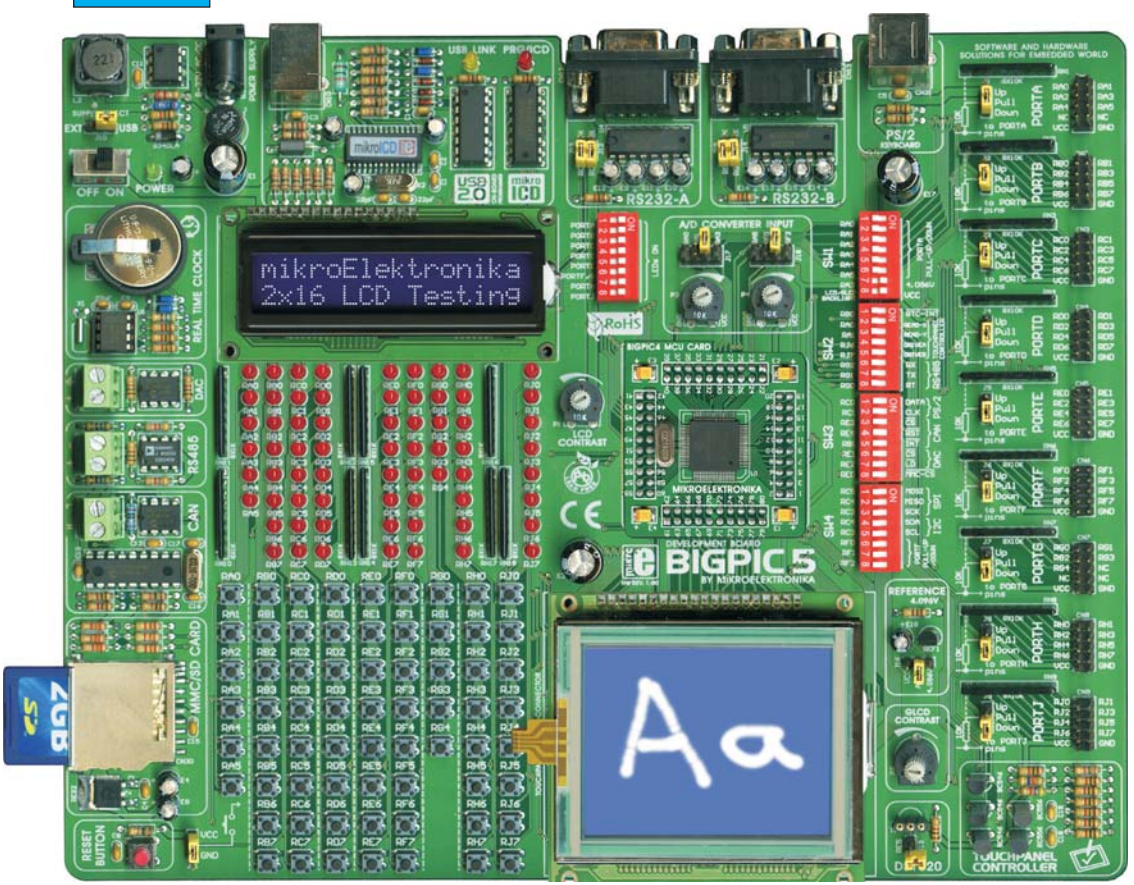
After these four steps, your BigPIC5 is successfully installed and ready for use. You can read a program from the chip or write a new one into it. The product CD provides numerous simple program examples which will make your first steps Easy...

INTRODUCTION

The BigPIC5 development system is a perfect tool for programming almost all Microchip PIC 64 and 80 pin microcontrollers. It allows students and engineers to easily test and explore the abilities of PIC microcontrollers. Additionally, it allows PIC microcontrollers to be interfaced with external circuits and a broad range of peripheral devices. The user can therefore concentrate on software development only.

Figure 1 illustrates the BigPIC5 development system. As can be seen, there are identification marks next to each component on a silkscreen, both on the top and bottom. These marks describe connecting to the microcontroller, operation modes and provide additional useful information as well. In that way all relevant information is provided on the board so that there is almost no need for additional schematics.

Figure 1



SWITCHES

The BigPIC5 development system features a number of peripheral devices. In order to enable them before programming, the appropriate jumpers or switches have to be properly set. Switches are mechanical devices used to establish or break connection between two contacts. The BigPIC5 development system has five groups of switches.

Switch group **SW1** is used to enable external pull-up/pull-down resistors on PORTA pins RA0-RA5, provide reference voltage 4.096V on pin RA3 and turn on/off LED backlight on both LCD displays.

Switch group **SW2** enables interrupt signal from real time clock, touch panel controller and RS485 communication.

Switch group **SW3** enables CAN communication module and D/A converter. It is also used for connecting PS/2 keyboard and MMC cards to development system.

Switch group **SW4** is used to enable SPI and I2C communication. Besides, three switches of this group enables external pull-up/pull-down resistors on PORTF pins RF0-RF2.

Switch group **SW5** is used to enable/disable LEDs connected to the microcontroller ports. Each port has its own LEDs on/off switch.

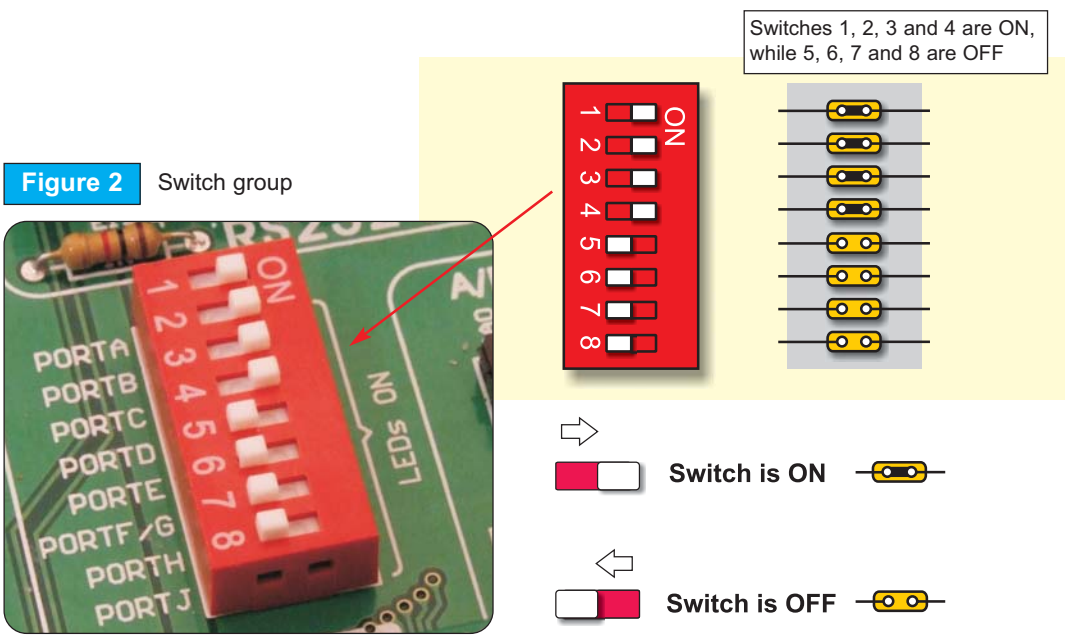
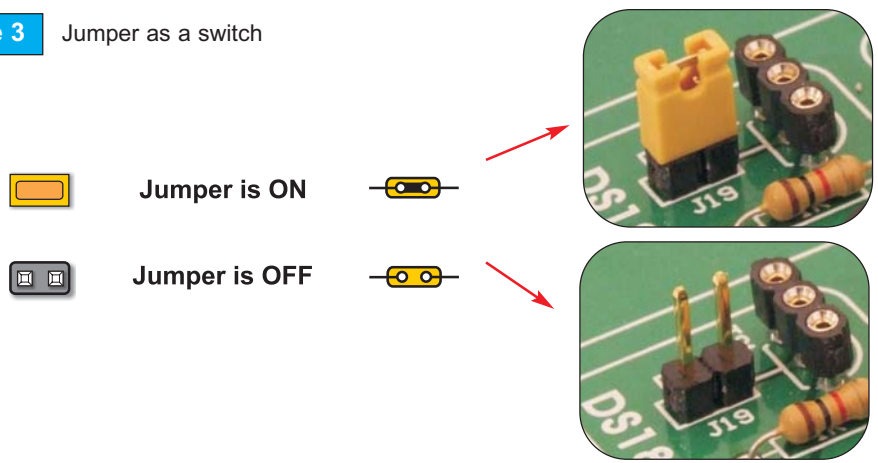


Figure 2 Switch group

JUMPERS

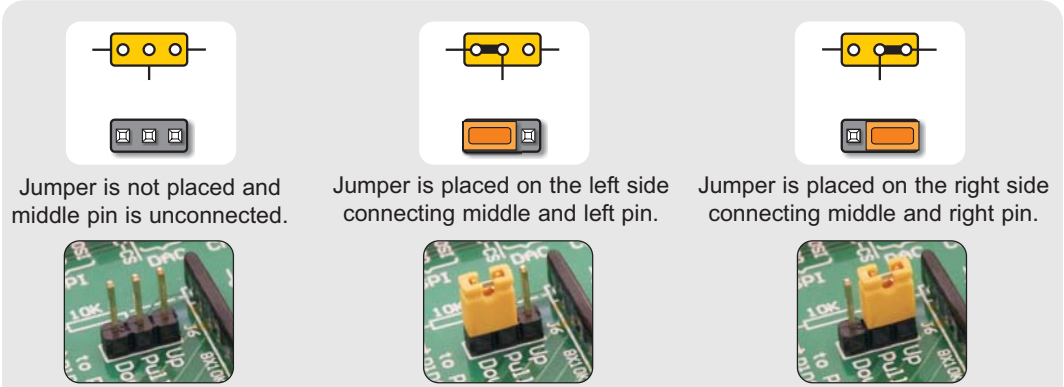
Similar to switches, jumpers are used to break or establish connection between two points. Under the plastic cover of a jumper, there is a metal contact which establishes connection when the jumper is placed over two pins.

Figure 3 Jumper as a switch



Jumper is commonly used as a selector between two possible connections via 3-pin connector. As illustrated in figure 4, the middle connector pin can be connected to the left or right pin, depending on the jumper's position.

Figure 4 Jumper as a selector


Jumper is not placed and middle pin is unconnected.
Jumper is placed on the left side connecting middle and left pin.
Jumper is placed on the right side connecting middle and right pin.

MCU CARD

The BigPIC5 development system has an 80-pin MCU card with PIC18F8520-PT microcontroller on it. In order to use some other microcontroller, the MCU card must be changed. BigPIC5 MCU card is shown in figure below:

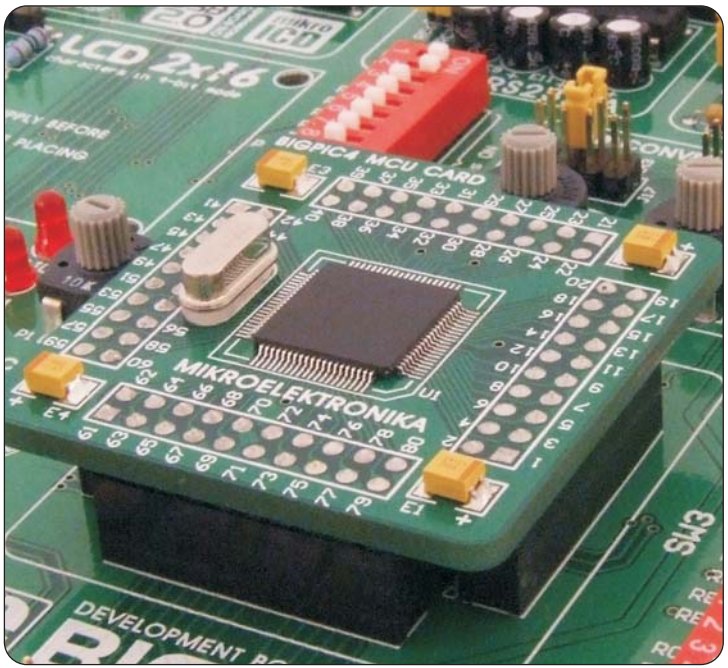
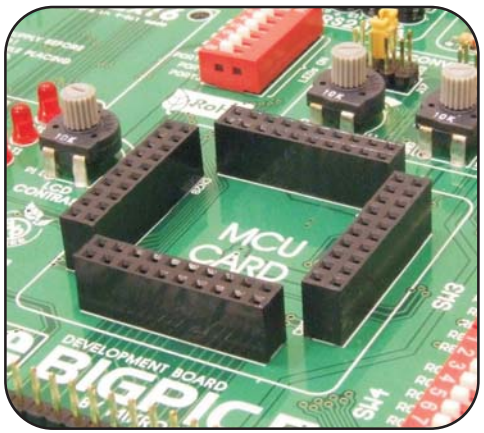


Figure 5 BigPIC MCU card

Follow the steps below to place MCU card in the BigPIC5 MCU socket properly:

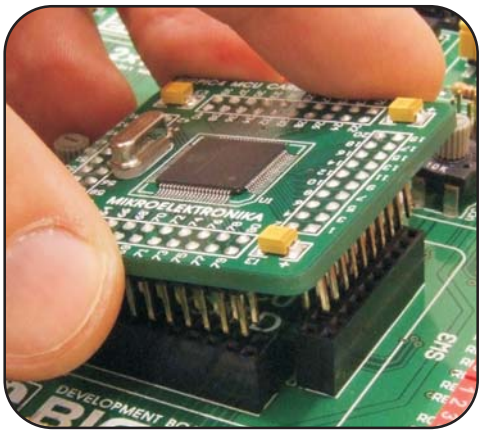


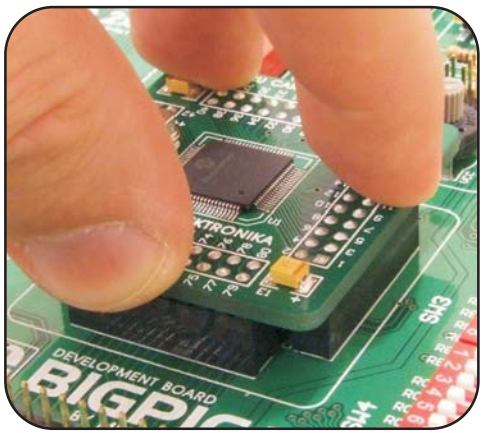
Step 1

If some MCU card is already placed on the BigPIC5 development system, it is necessary to remove it by pulling it up slowly.

Step 2

Place MCU card in the socket. Make sure that label on the MCU card matches the upper-left corner of the socket as outlined on the BigPIC5 board.





Step 3

When MCU card is placed in the proper position, press it evenly against the socket.

MCU PORTS

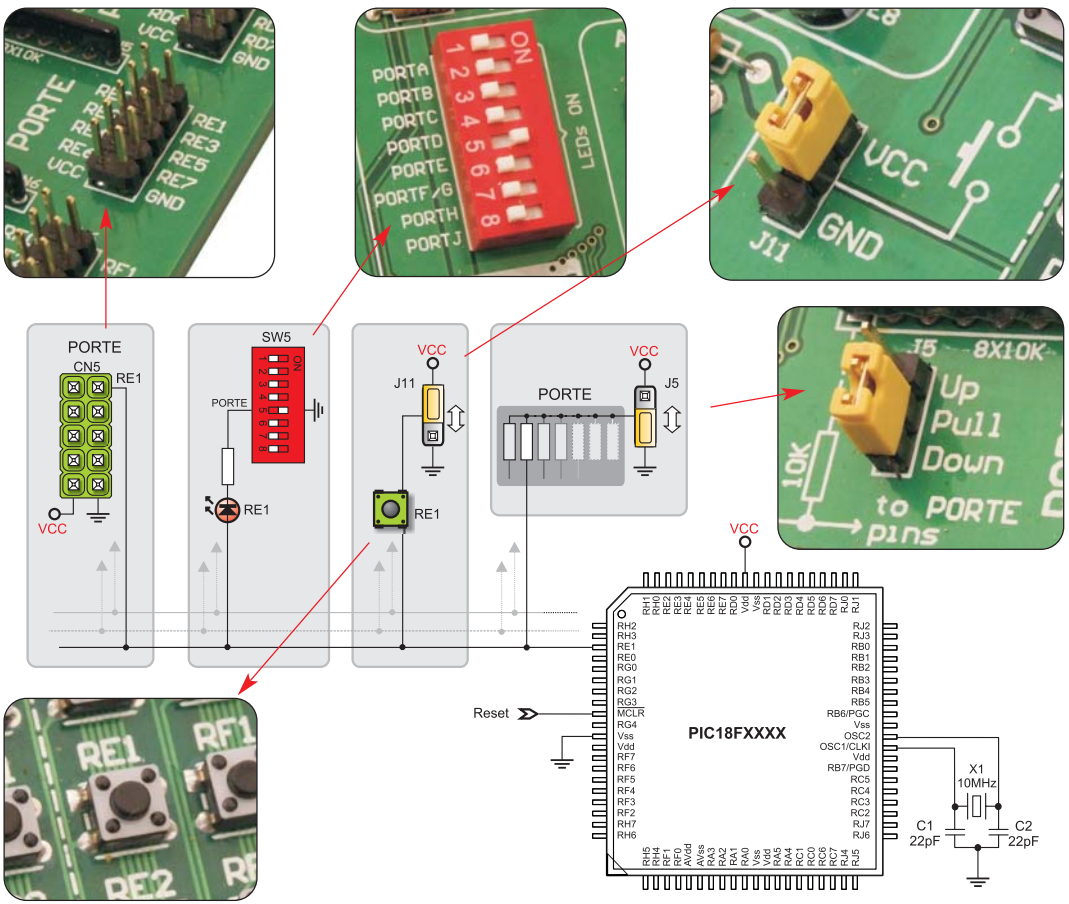
Microcontroller pins are routed to various peripherals as illustrated in figure 6.

All MCU ports are directly connected to 2x5 direct port access connectors on the right side of the board. Such connectors are normally used for connecting external peripherals to the board or for digital logic probes for testing and measurement.

All ports are also connected to LEDs and push-buttons, which allows easy monitoring and testing digital pin state.

Some pins are connected to other peripherals such as DS1820 temperature sensor, RS-232 communication, LCD etc. which depends on MCU internal peripheral organization.

Figure 6 System connecting

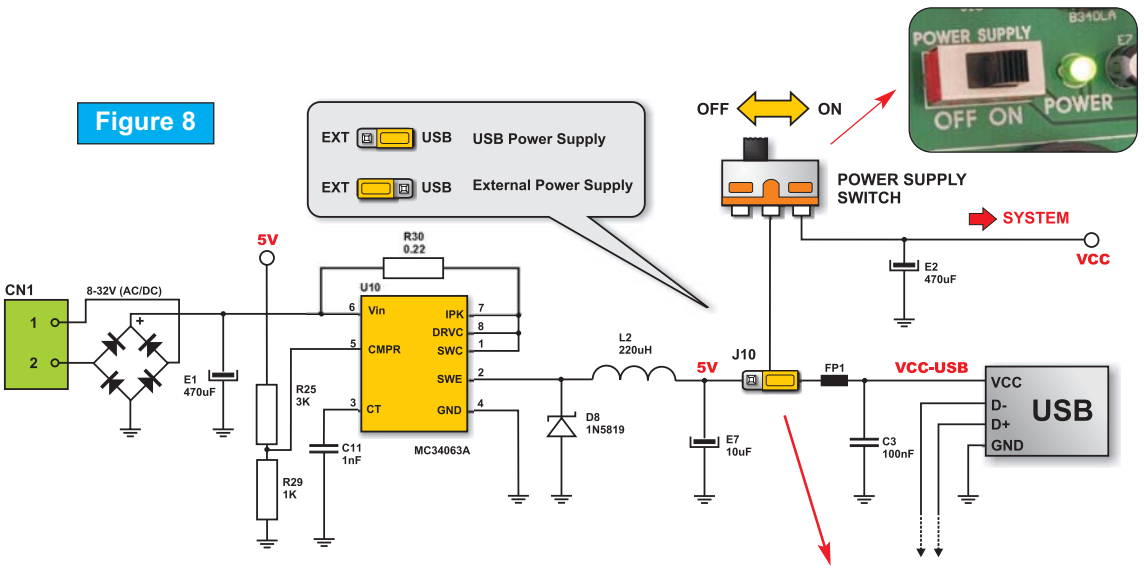


POWER SUPPLY

BigPIC5 can use two power supply sources - PC power supply over USB cable (by default) and external power supply (external AC/DC power adapter). When using power supply over USB, the system should be connected to PC using the USB programming cable and the jumper J10 should be set in right-hand position.

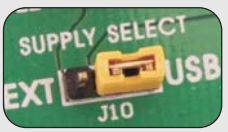
Figure 7 External power supply connector

Figure 8



When using external power supply, the BigPIC5 board produces +5V by means of MC34063A voltage regulator. The external power supply can be AC or DC with the voltage range of 8 - 32V. The jumper J10 should be set in left-hand position. Figure 8 illustrates USB and external power supply connections.

J10 in left-hand position: system is powered from external AC/DC power adapter.



J10 in right-hand position: system is powered from PC via USB cable.

Figure 9 Power supply select jumper

ON-BOARD USB 2.0 PROGRAMMER

There is no need to use external equipment during programming since the BigPIC5 development system contains on-board USB 2.0 programmer. It is only needed to connect the system to PC using the USB cable. Then, the program should be loaded into the microcontroller using the *PICflash* programming software supplied with BigPIC5 development system.

For more information, please refer to *PICflash* documentation.

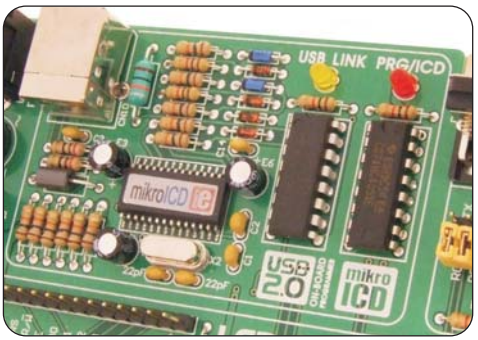


Figure 10 USB 2.0 programmer

Red button in the bottom left corner marked as RESET is used for MCU reset.

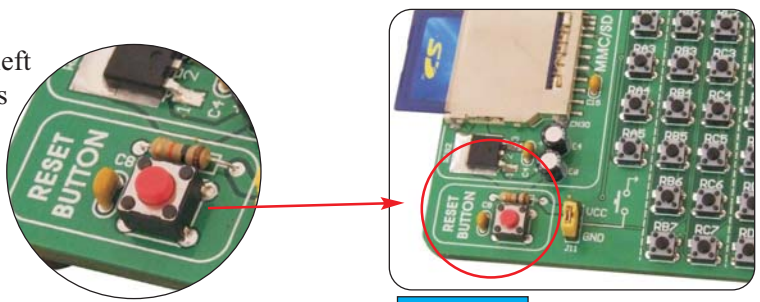
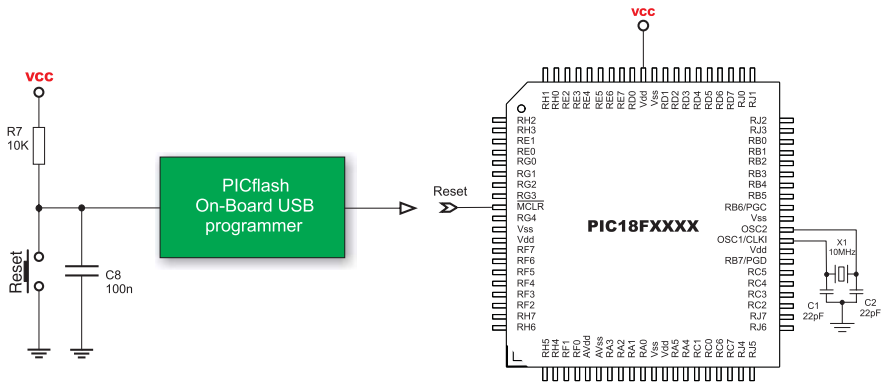


Figure 11 Reset button



Note: There is no need to reset MCU after programming because the programmer will reset the MCU automatically.

MikroICD (HARDWARE IN-CIRCUIT DEBUGGER)

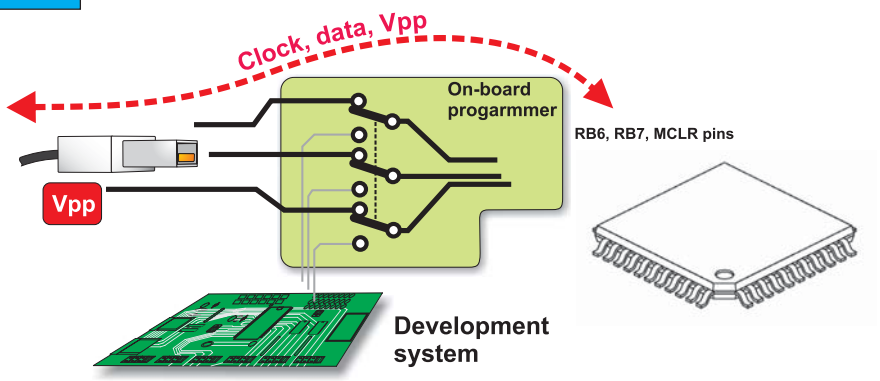
MikroICD is a highly effective tool for real-time debugging on hardware level. The mikroICD debugger enables the user to execute a program on the PIC microcontroller and view variable values, special function registers (SFRs) and EEPROM while the program is running.
MikroICD can be used with any PIC compiler designed by MikroElektronika (mikroC, mikroBasic or mikroPascal). It is necessary to select the appropriate build type (Release or ICD Debug), build the project, program the MCU and run debugger.

The mikroICD debugger uses on-board programmer to communicate with the compiler and supports common debugger commands:

Start Debugger	[F9]
Run/ Pause Debugger	[F6]
Toggle Breakpoints	[F5]
Run to cursor	[F4]
Step Into	[F7]
Step Over	[F8]
Flush RAM	[F2]
Stop Debugger	[Ctrl+F2]

Figure 12 On-Board USB programmer with mikroICD

Figure 13 Program debugging

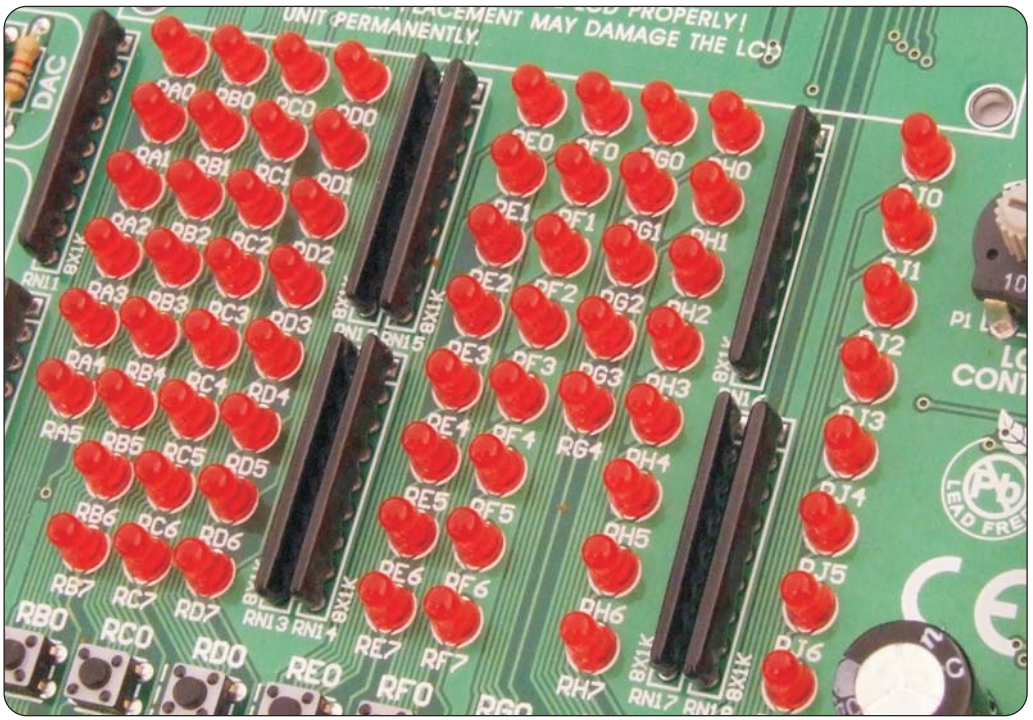


Note: For more information on how to use mikroICD debugger please refer to the mikroICD documentation *"mikroICD User's Manual"*. It can be also find in Help documentation inside any of mentioned compilers.

LEDs

Light Emitting Diodes (LEDs) are components most commonly used for displaying pin digital state. BigPIC5 has 67 LEDs connected to the microcontroller PORTA, PORTB, PORTC, PORTD, PORTE, PORTF, PORTG, PORTH and PORTJ.

Figure 14 On-board LEDs

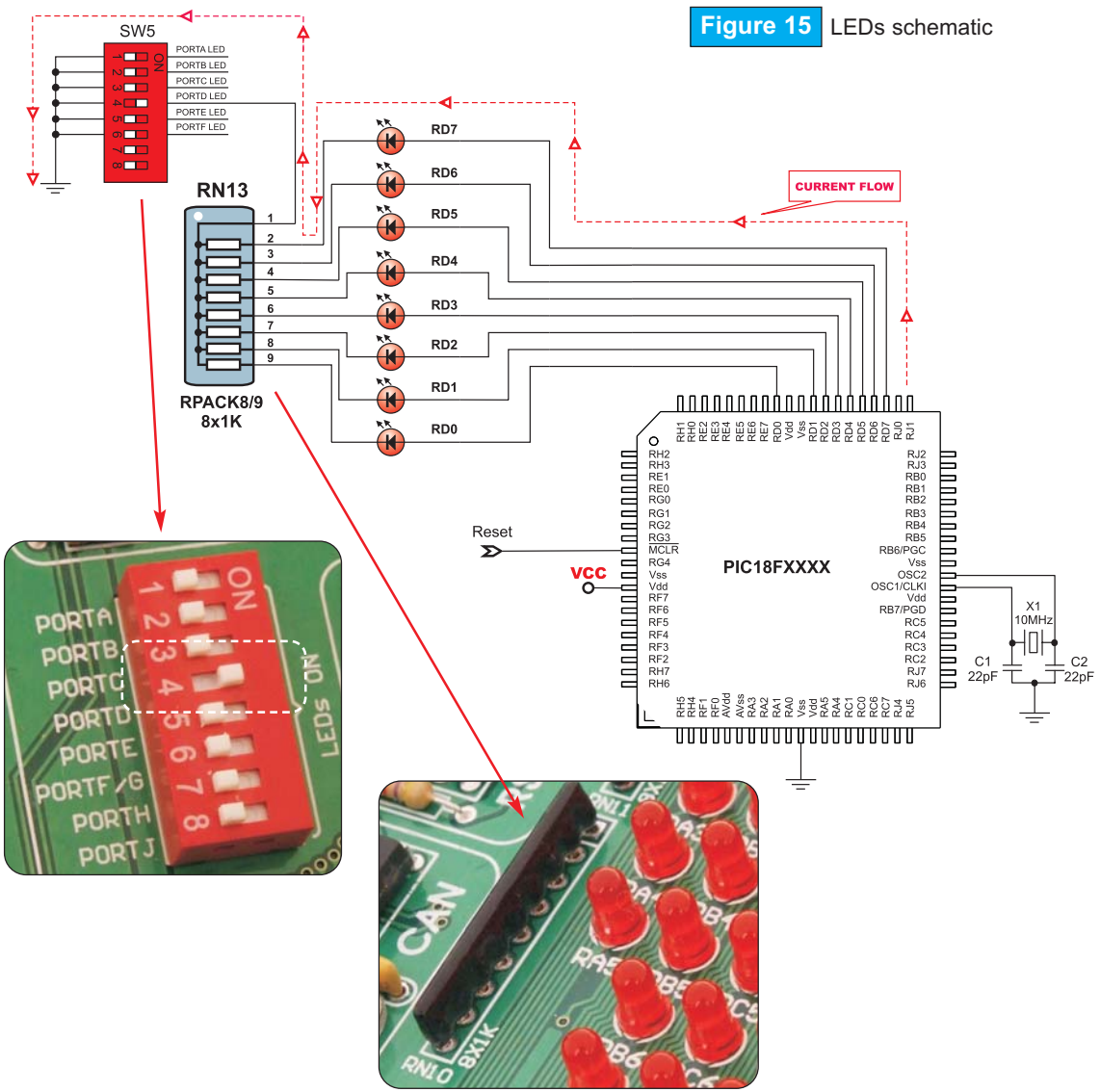


LEDs are arranged in nine groups. With the exception of PORTA and PORTG, each group consists of eight LEDs and can be enabled or disabled using switches of the switch group SW5. PORTA and PORTG have 6 and 5 LEDs, respectively.

The LEDs are enabled when the corresponding switch of the SW5 is ON. When enabled, LEDs displays the state of the corresponding microcontroller pin. Otherwise, the LEDs are always off, no matter what the port state is, since no current can flow through them.

Figure 15 illustrates the connection between PORTD pins and the corresponding LEDs. A resistor is serially connected to LEDs in order to limit current through them. In this case the resistor value is 1K.

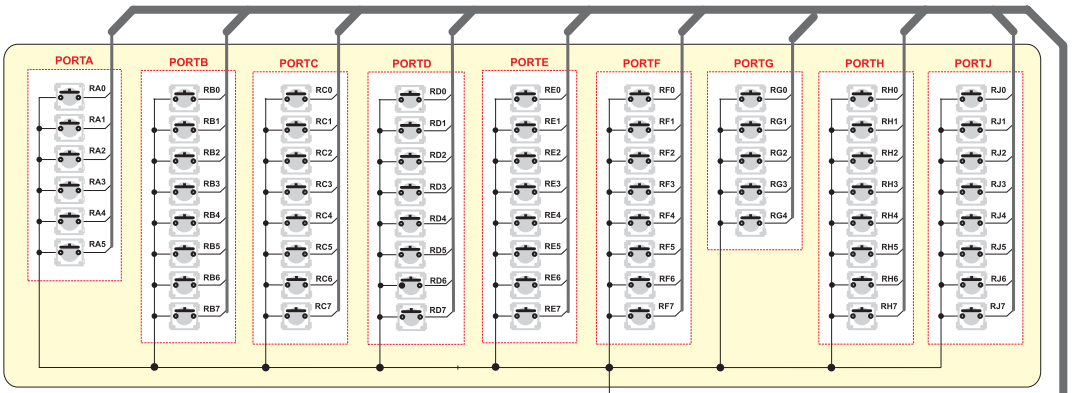
Figure 15 LEDs schematic



PUSH-BUTTONS

BigPIC5 has 67 push-buttons used to change the state of digital inputs on the microcontroller ports. Figure 16 illustrates the connection between push-buttons and the corresponding port pins. Jumper J11 determines whether a button press will bring logic zero (0) or logic one (1) to the appropriate pin. When a button is released, pin state is determined by pull-up or pull-down resistor.

Figure 16 Push-buttons schematic



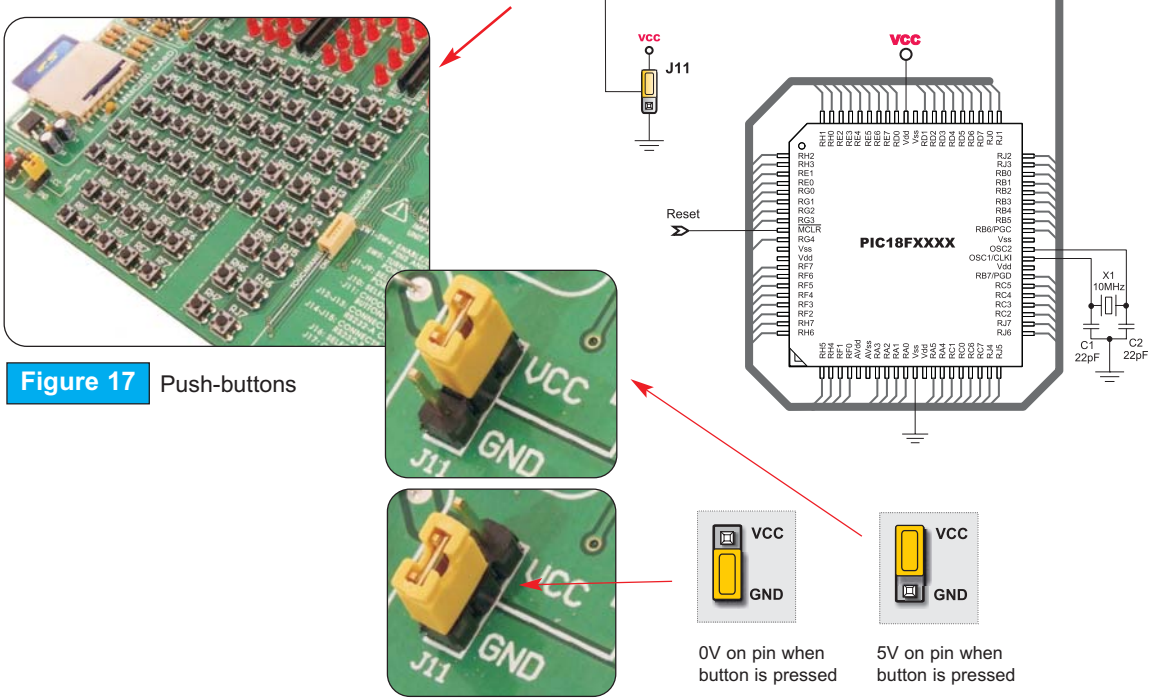
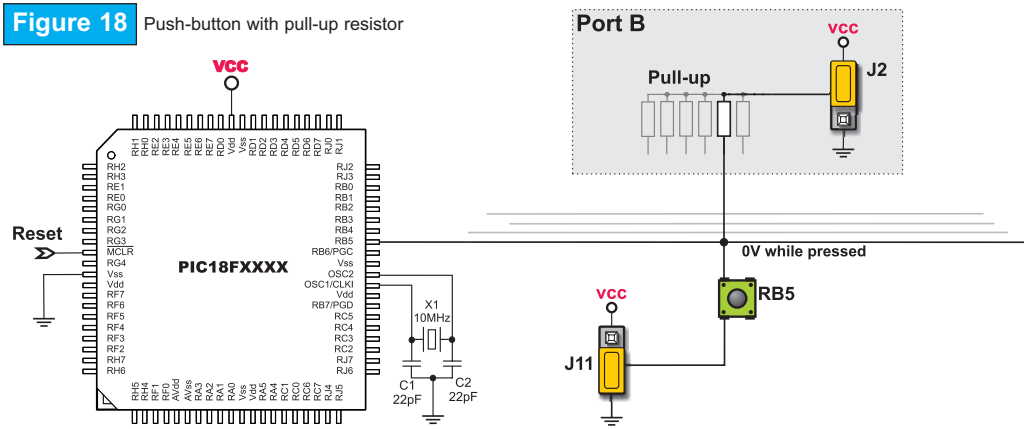


Figure 17 Push-buttons

Referring to figure 18, jumper J2 is set to pull-up position, so that pull-up resistor pulls the microcontroller RB5 pin to +5V. By pressing button, the port pin is connected to ground (J11 is in lower position).
Accordingly, only in case the button is pressed the microcontroller will sense a logic zero (0). Otherwise, the pin state will always be logic one (1).

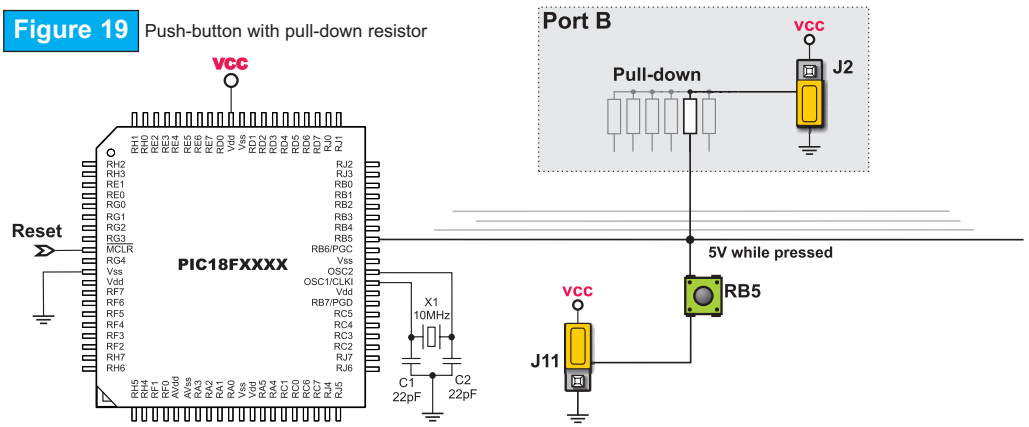
Figure 18 Push-button with pull-up resistor



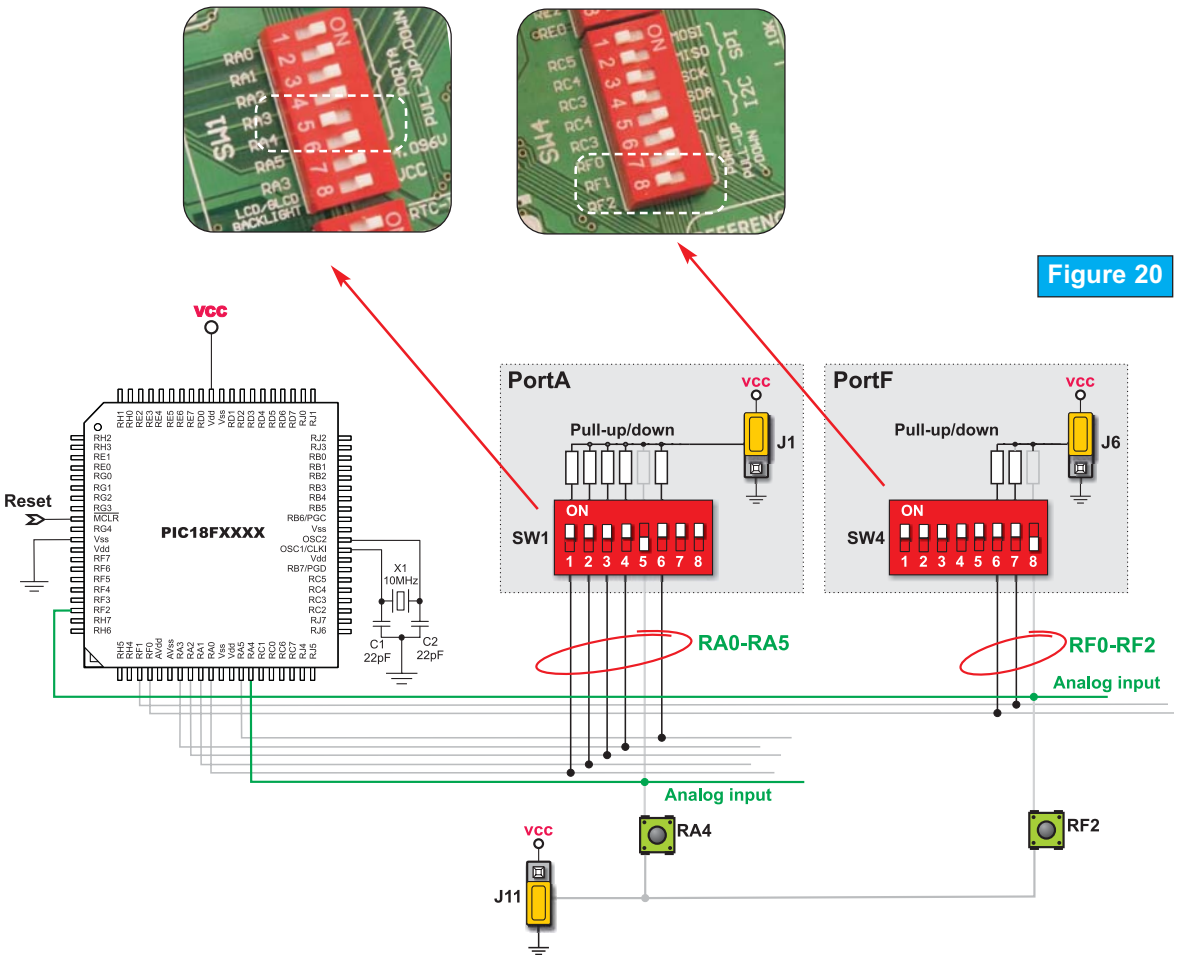
Referring to figure 19, jumper J2 is set to pull-down position, so that pull-down resistor pulls the microcontroller RB5 pin to 0V.
By pressing button, the port pin is connected to +5V (J11 is in higher position).

Accordingly, only when the button is pressed the microcontroller will sense a logic one (1). Otherwise, the pin state will always be logic zero (0).

Figure 19 Push-button with pull-down resistor



In order to avoid influence of pull-up/pull-down resistors on MCUs analog inputs, several pins on PORTA and PORTF could be disconnected from belonging resistors using switches in groups SW1 and SW4. Figure 20 illustrates such connection of RA0-RA5 and RF0-RF2 pins. In shown example, RA4 and RF2 are disconnected from rest of circuit and can be used as analog inputs. Because other pins of PORTA and PORTF are still connected to VCC trough pull-up resistors, their idle state will be high.



2X16 CHARACTER LCD

A standard character LCD is probably the most frequently used data visualization component. It can display messages in two lines each containing up to 16 alphanumeric characters. Characters are made up of 5x8 pixels. The character LCD communicates with the microcontroller via 4-bit data bus. Connecting to the microcontroller is shown in figure 22.

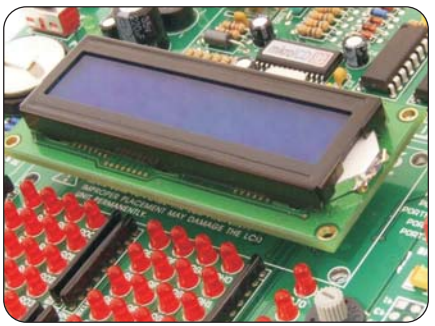


Figure 21 2x16 LCD in 4-bit mode

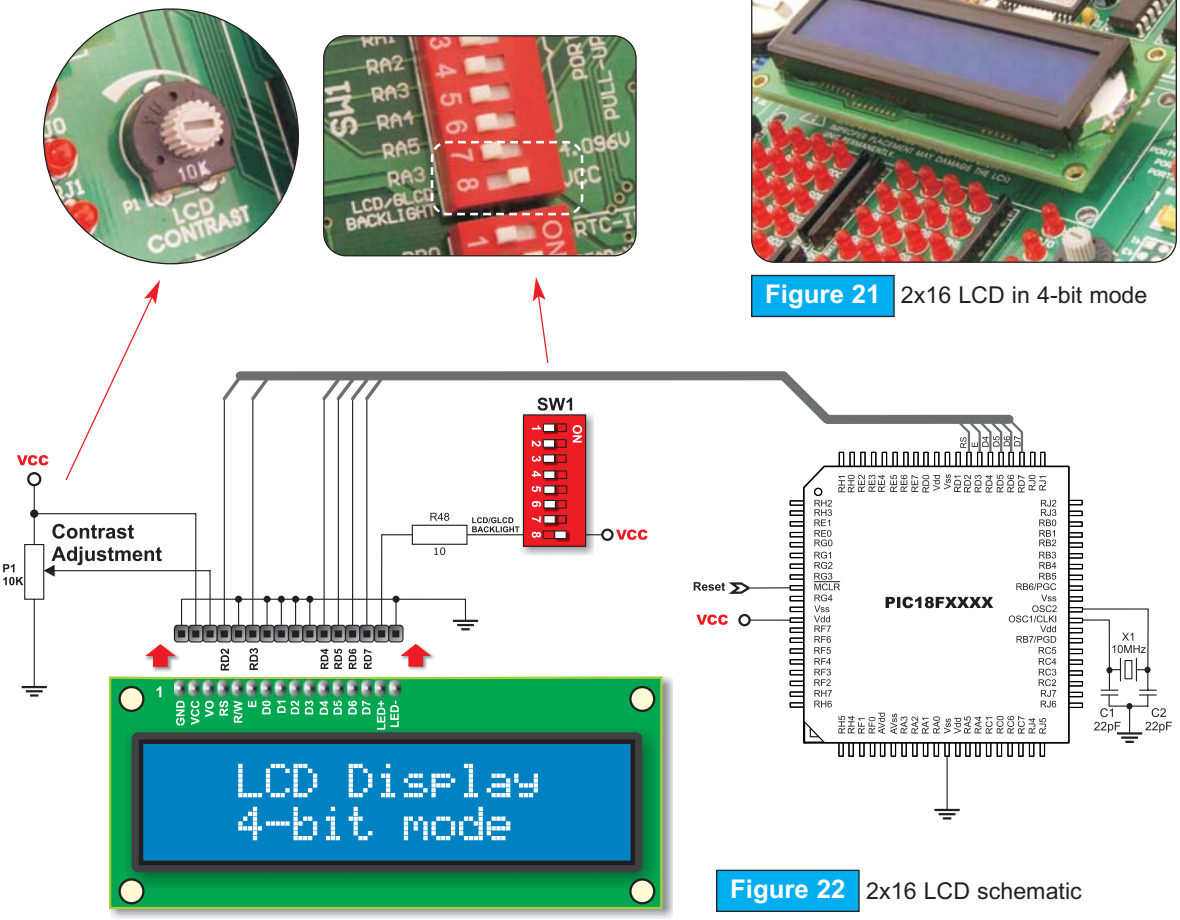


Figure 22 2x16 LCD schematic

Note: It is important to have in mind that LCD should be placed on or removed from BigPIC5 development board only after the power is switched off.

GRAPHIC LCD

A graphic LCD (GLCD) allows advanced visual messages to be displayed. While a character LCD can display only alphanumeric characters, a GLCD can be used to display messages in the form of drawings and bitmaps. The most commonly used graphic LCD has 128x64 pixels screen resolution. The GLCD contrast can be adjusted using the potentiometer P2 placed on the right of the GLCD.

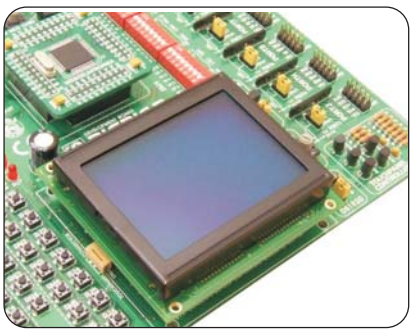
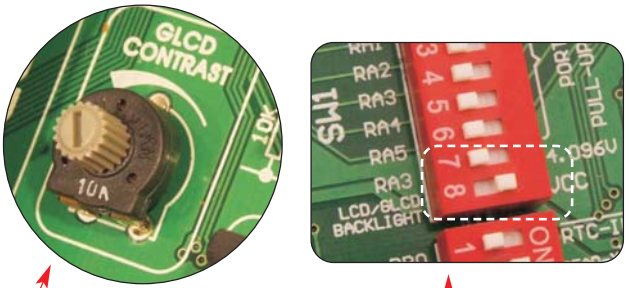


Figure 24 GLCD

Figure 23 GLCD contrast adjustment potentiometer



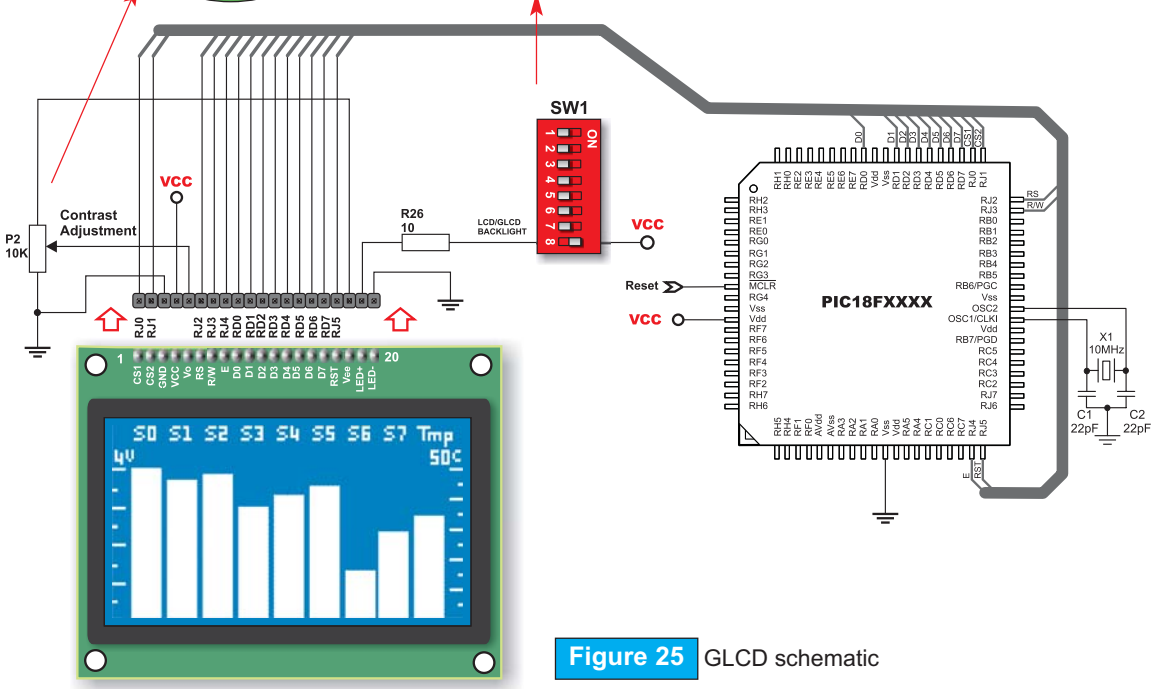


Figure 25 GLCD schematic

TOUCH PANEL

Touch panel is a thin, self-adhesive, transparent plate which could be placed over screen of graphic LCD. It consists of two separate plates which form "sandwich" structure. They are very sensitive to pressure so that even a soft touch causes some changes on output signal. It is used in various user-friendly devices in combination with graphic LCD.

Connector CN16 enables this device to be connected to on-board touch panel controller whose active part consists of 5 discrete transistors. Four switches of the switch group SW2 enable or disable connection between this controller and RA0, RA1, RJ6 and RJ7 pins.

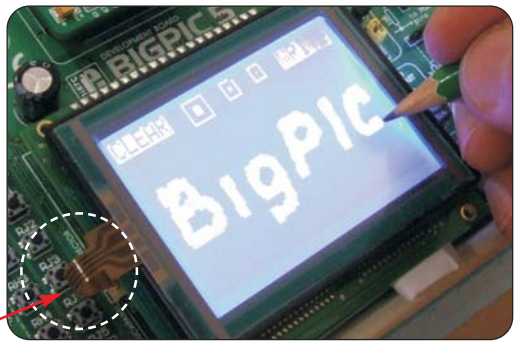


Figure 26 Touch panel on graphic LCD

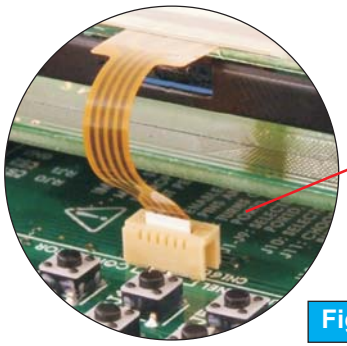
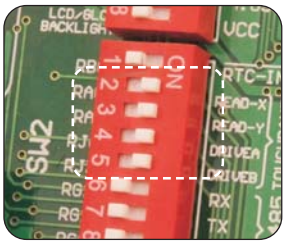


Figure 27 Touch panel connector



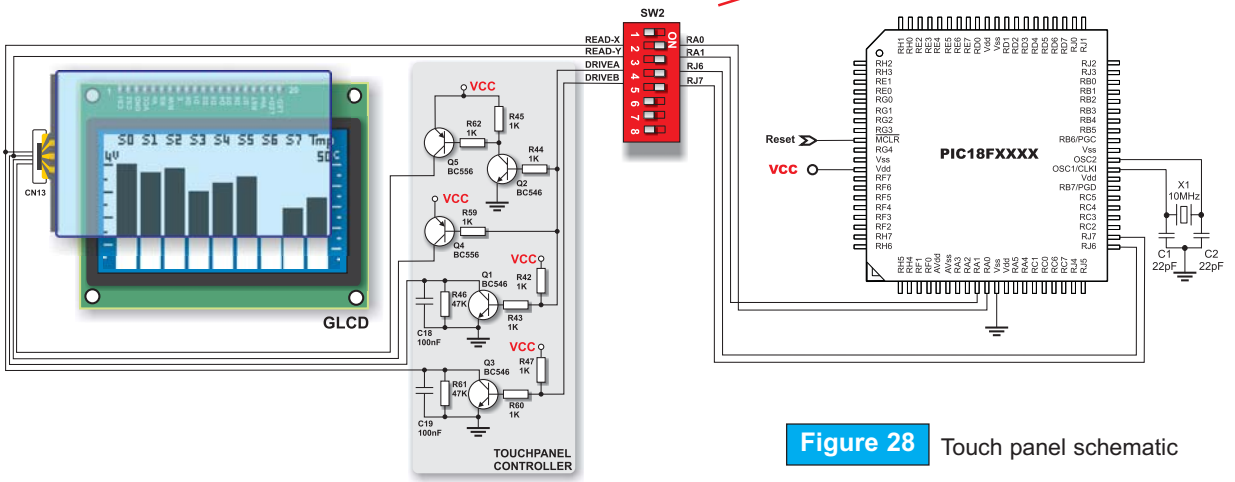


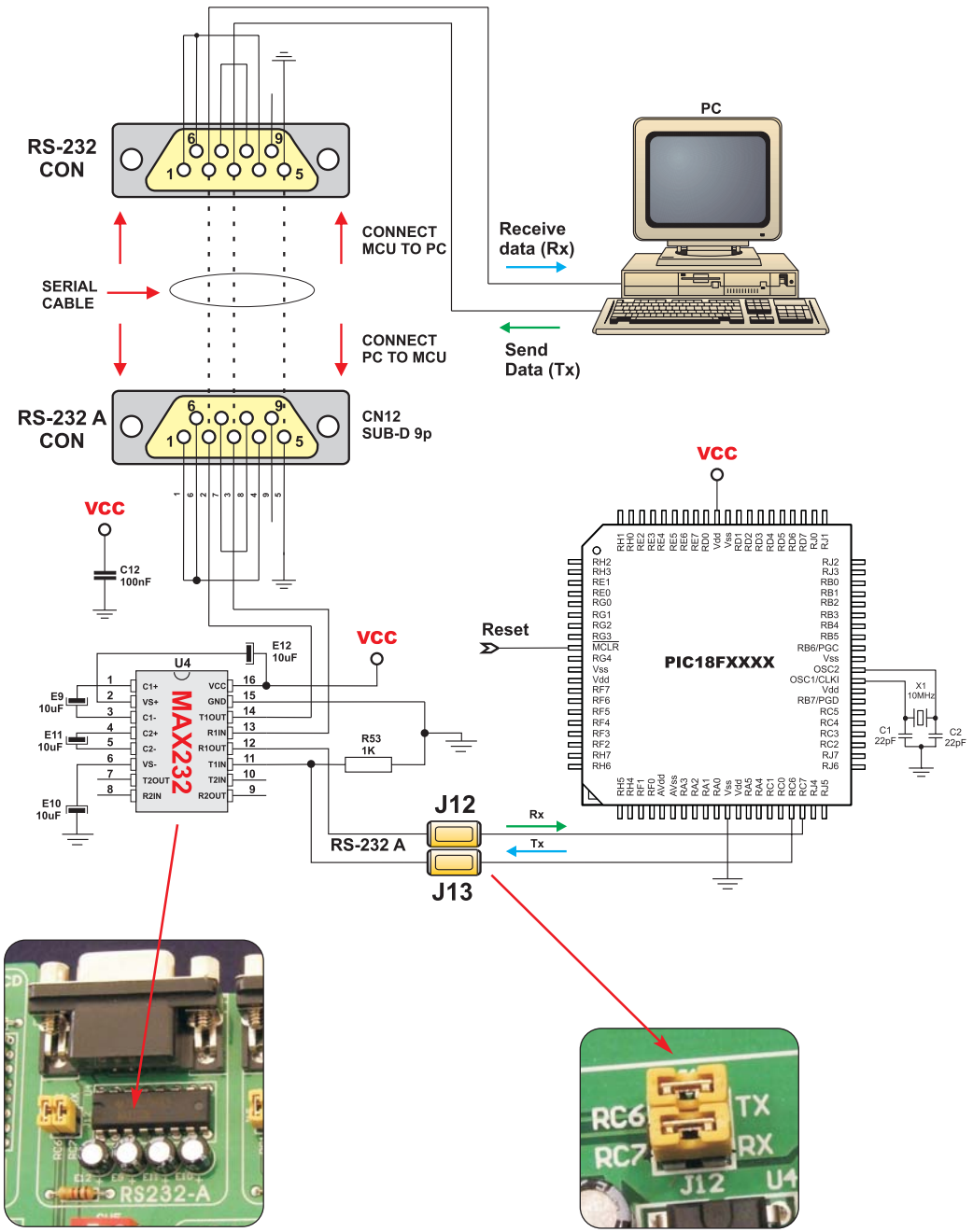
Figure 28 Touch panel schematic

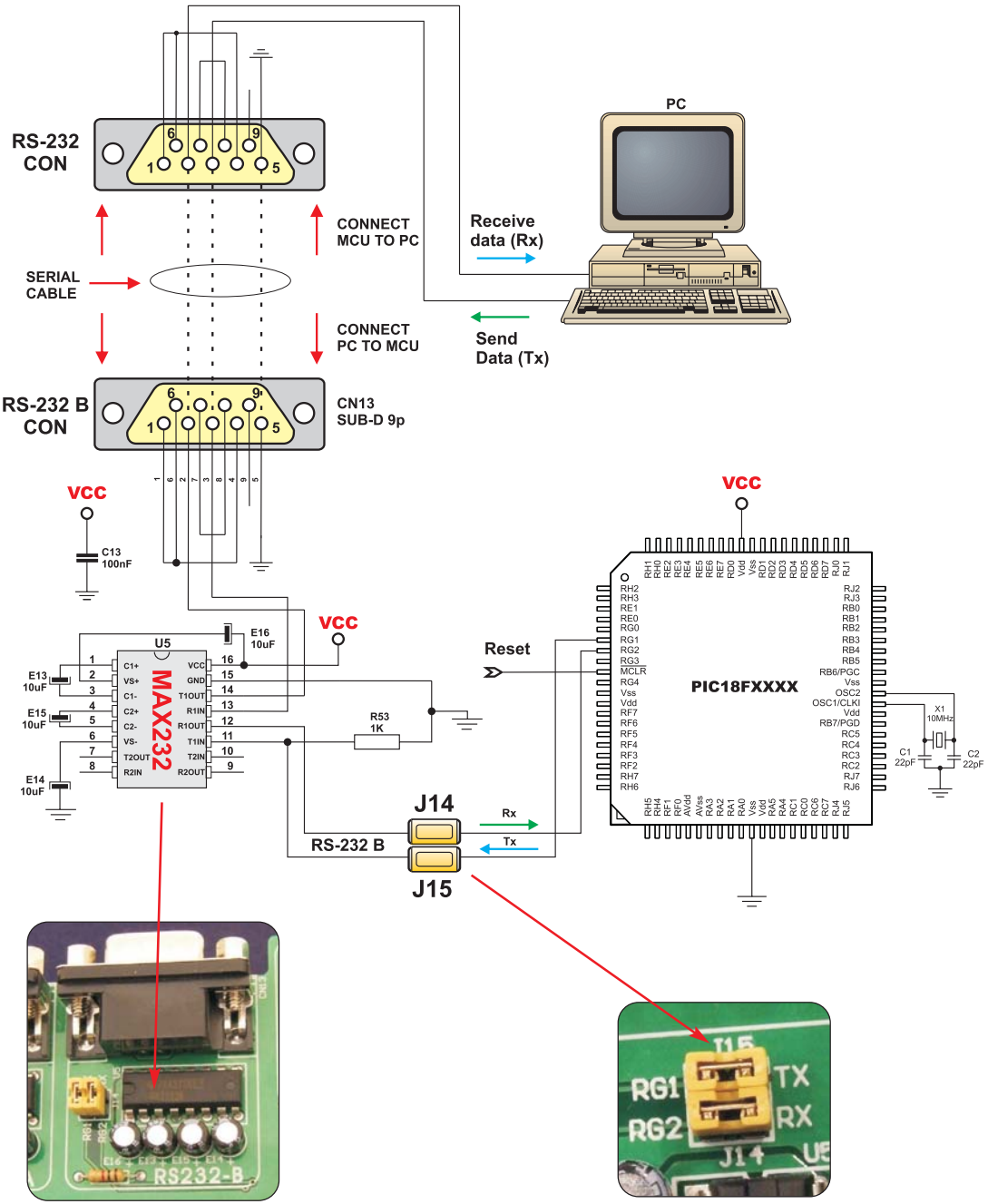
RS-232 COMMUNICATION

RS-232 communication enables point-to-point data transfer. It is commonly used in data acquisition applications to transfer data between the microcontroller and PC. Since the voltage levels of the microcontroller and PC are not directly compatible with each other, a level transition buffer such as the MAX232 must be used.

BigPIC5 development board has two RS-232 communication devices, RS-232 A and RS-232 B. In order to provide a more flexible system, the microcontroller is connected to two MAX232 chips through the jumper groups J13 and J15. The first group is used to connect MCU pins RC7 and RC6 to Rx and Tx lines of RS-232 A, whereas later is used for connecting pins RG2 and RG1 to Rx and Tx lines of RS-232 B.

Figure 29 RS232 connectors


RS-232 CON
6
9
1
5
PC
CONNECT MCU TO PC
Receive data (Rx)
SERIAL CABLE
CONNECT PC TO MCU
Send Data (Tx)
RS-232 A CON
CN12 SUB-D 9p
VCC
C12 100nF
VCC
Reset
PIC18FXXXX
U4
MAX232
E12 10uF
E9 10uF
E11 10uF
E10 10uF
R53 1K
J12
J13
RS-232 A
Rx
Tx
X1 10MHz
C1 22pF
C2 22pF
RS232-A
RC6
RC7
TX
RX
J12
U4


RS-232 CON
PC
CONNECT MCU TO PC
Receive data (Rx)
SERIAL CABLE
CONNECT PC TO MCU
Send Data (Tx)
RS-232 B CON
CN13 SUB-D 9p
VCC
C13 100nF
U5
MAX232
E16 10uF
E13 10uF
E15 10uF
E14 10uF
R53 1K
Reset
PIC18FXXXX
X1 10MHz
C1 22pF
C2 22pF
J14
J15
RS232-B
RG1
RG2
TX
RX

PS/2 COMMUNICATION

PS/2 connector allows direct connection between BigPIC5 and devices which use PS/2 communication, such as a PC, a keyboard or a mouse. For example, the microcontroller can be connected either to a keyboard to capture pressed keys or to a PC to act as a keyboard. CLK and DATA lines are used for data transfer. They are connected to the MCU pins RC1 and RC0 respectively.

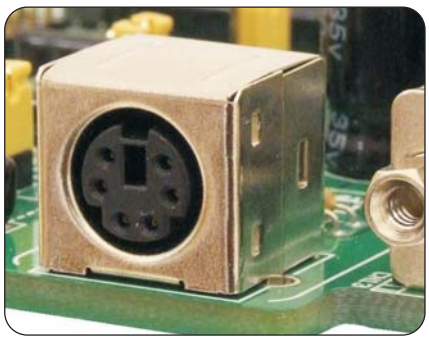
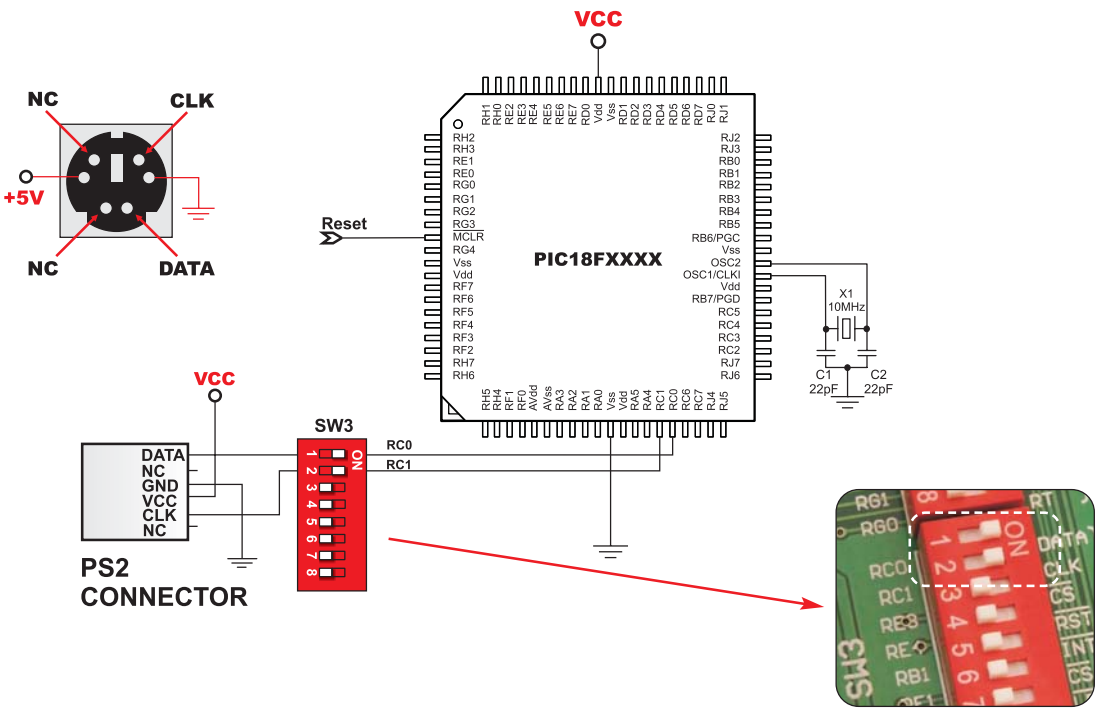


Figure 30 PS/2 connector

Figure 31 PS/2 communication schematic



DS1820 DIGITAL THERMOMETER

DS1820 digital thermometer is convenient for temperature measurement in the range of -55°C to 125°C with +/-0.5°C accuracy. It must be properly placed in the 3-pin socket provided on the BigPIC5 development board, with its rounded side up, as marked on the board (see figure below). Otherwise the DS1820 could be permanently damaged. DS1820 data pin can be connected to RE5 pin using the jumper J19.

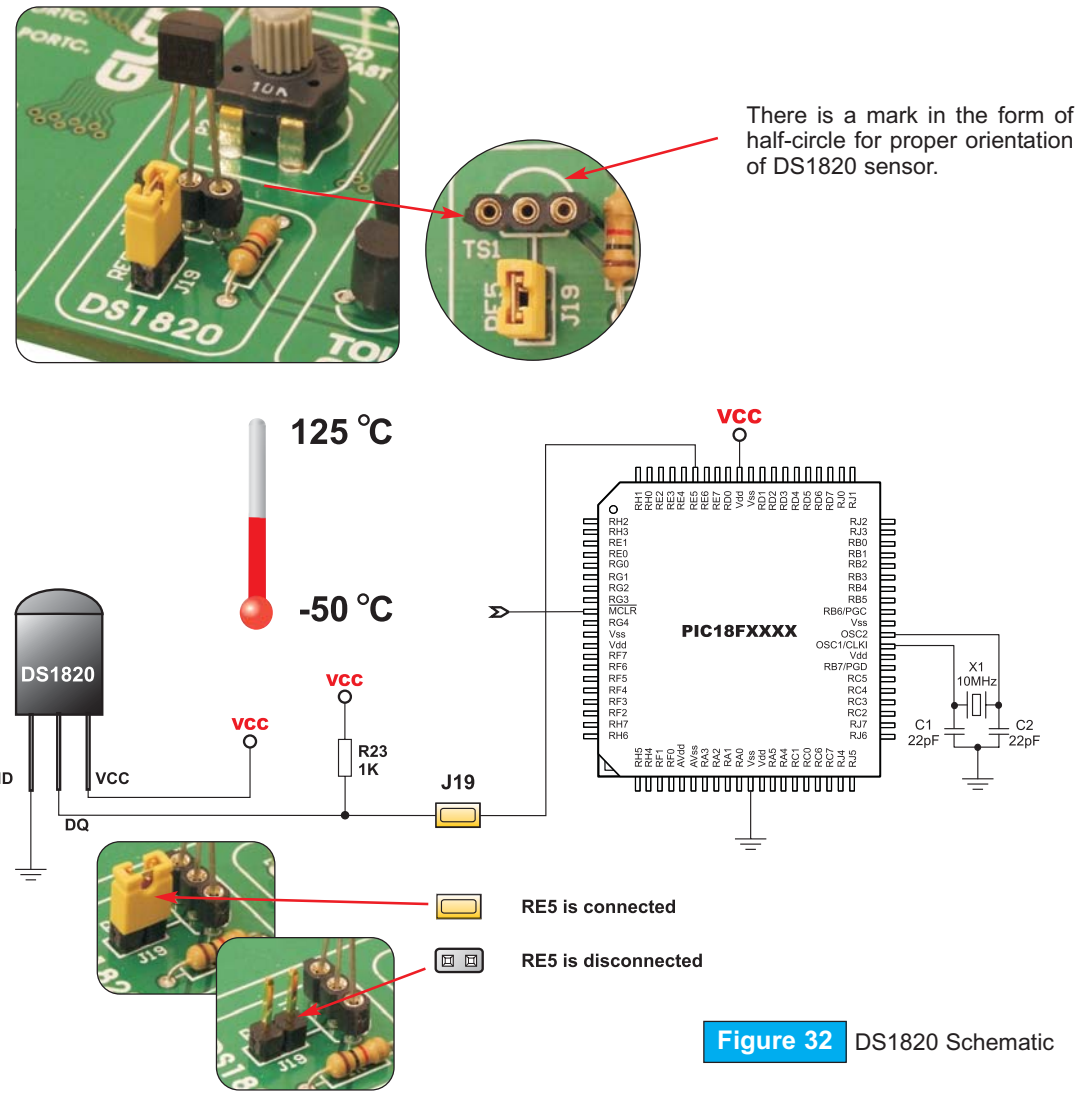


Figure 32 DS1820 Schematic

A/D CONVERTER INPUT

The BigPIC5 development board has two potentiometers used to demonstrate the operation of analog-to-digital converter (ADC). Both potentiometers outputs are in the range of 0-5V and their signals can be connected to two different analog input pins simultaneously. The jumper group J17 enables connection between potentiometer P3 and one of the following pins: RA0, RA1, RA2 or RA3. The jumper group J18 enables connection between potentiometer P4 and one of the following pins: RA5, RF0, RF1 or RF2.

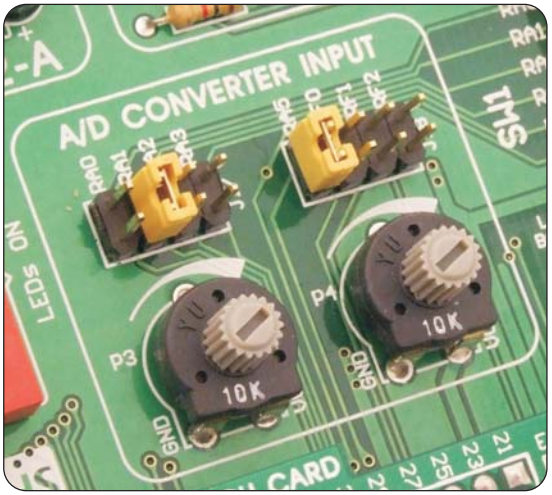
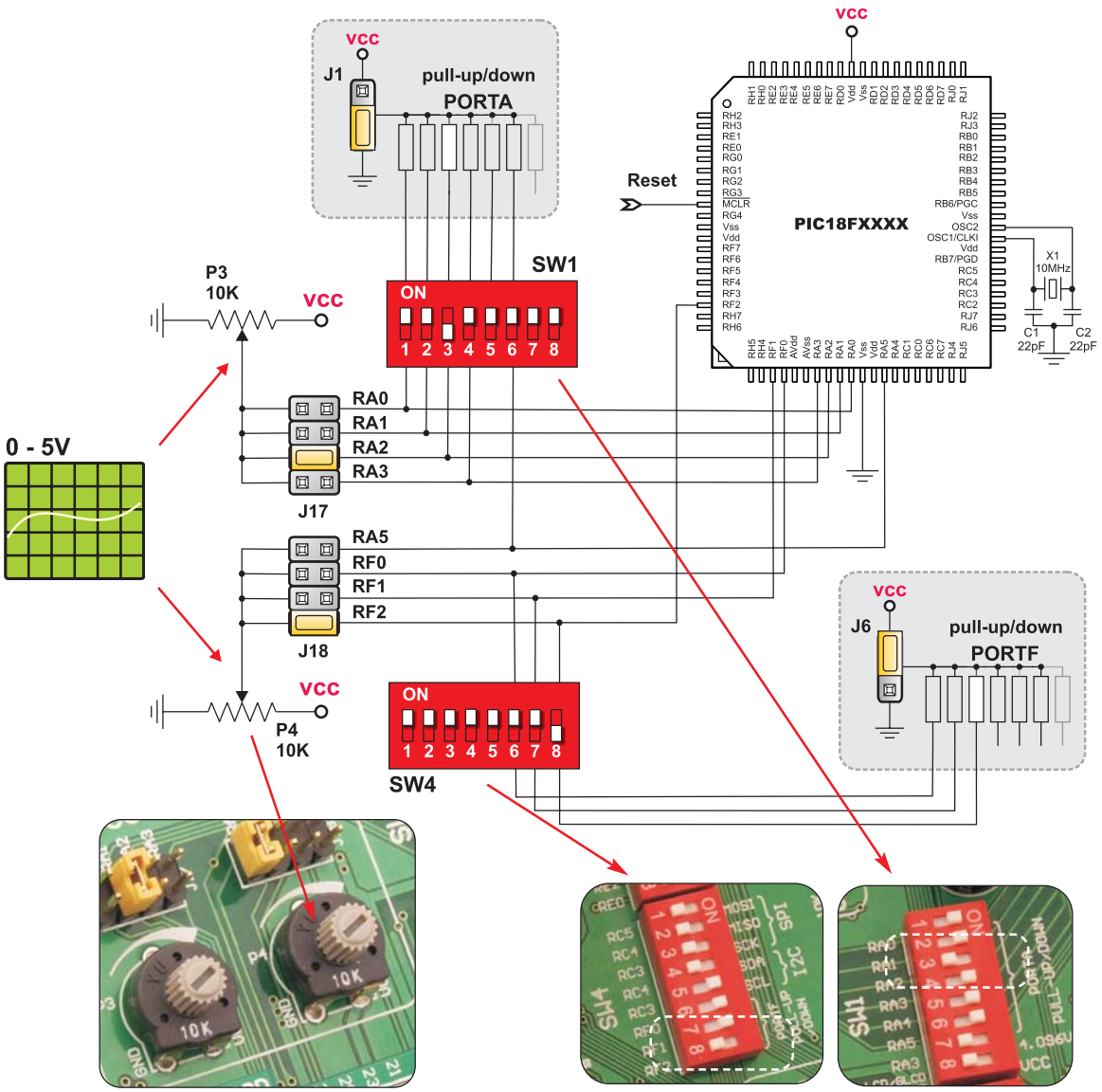


Figure 33 A/D Converter input

In order to measure analog signal without interference, the corresponding switches of the switch groups SW1 and SW4 must be turned off. In that way, the connection between PORTA/PORTF pins and external pull-up/down resistors is disabled.

The microcontroller takes analog signal from its input pin and converts it into digital value. Basically, any analog signal that fits in the range acceptable by PIC can be measured. That range is 0-5V.

Figure 34 A-D converter input

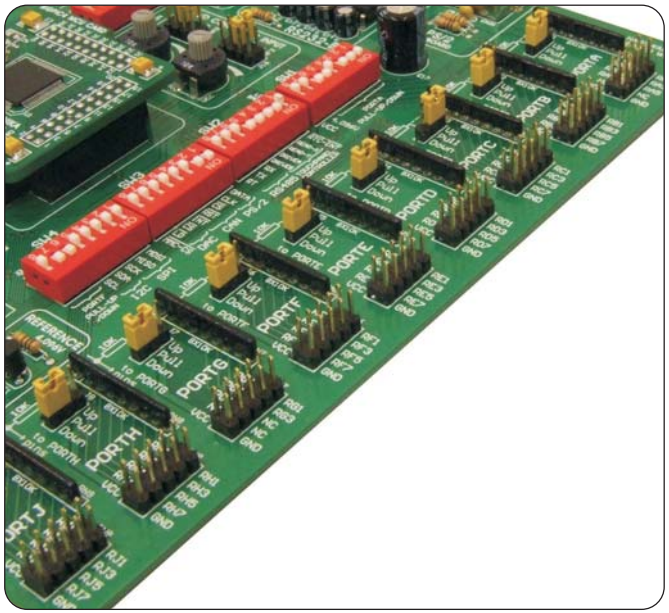


In this case, potentiometer P3 is connected to RA2 pin, whereas potentiometer P4 is connected to RF2 pin.

SW1 and SW4 disable pull-up/down resistors on PORTA and PORTF analog input pins.

DIRECT PORT ACCESS

All the microcontroller input/output pins can be accessed via 2 x 5 connectors placed along the right side of the board. For each microcontroller port, there is one 10-pin connector providing eight port pins and two additional pins connected to VCC and GND.



These connectors can be used to connect the system to external devices such as Serial Ethernet, Compact Flash, keyboard etc. On-board peripherals must be disconnected from the microcontroller using the appropriate jumpers /switches if external and on-board peripherals use the same pins. The connectors can be also used for attaching logic probes or other test equipment.

Figure 35 Direct port access connectors

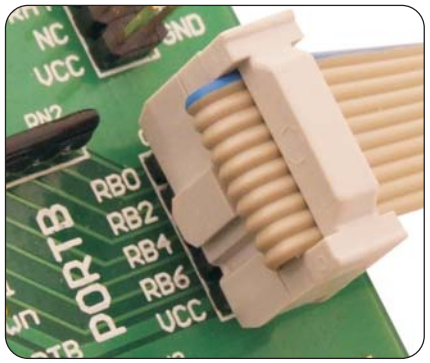
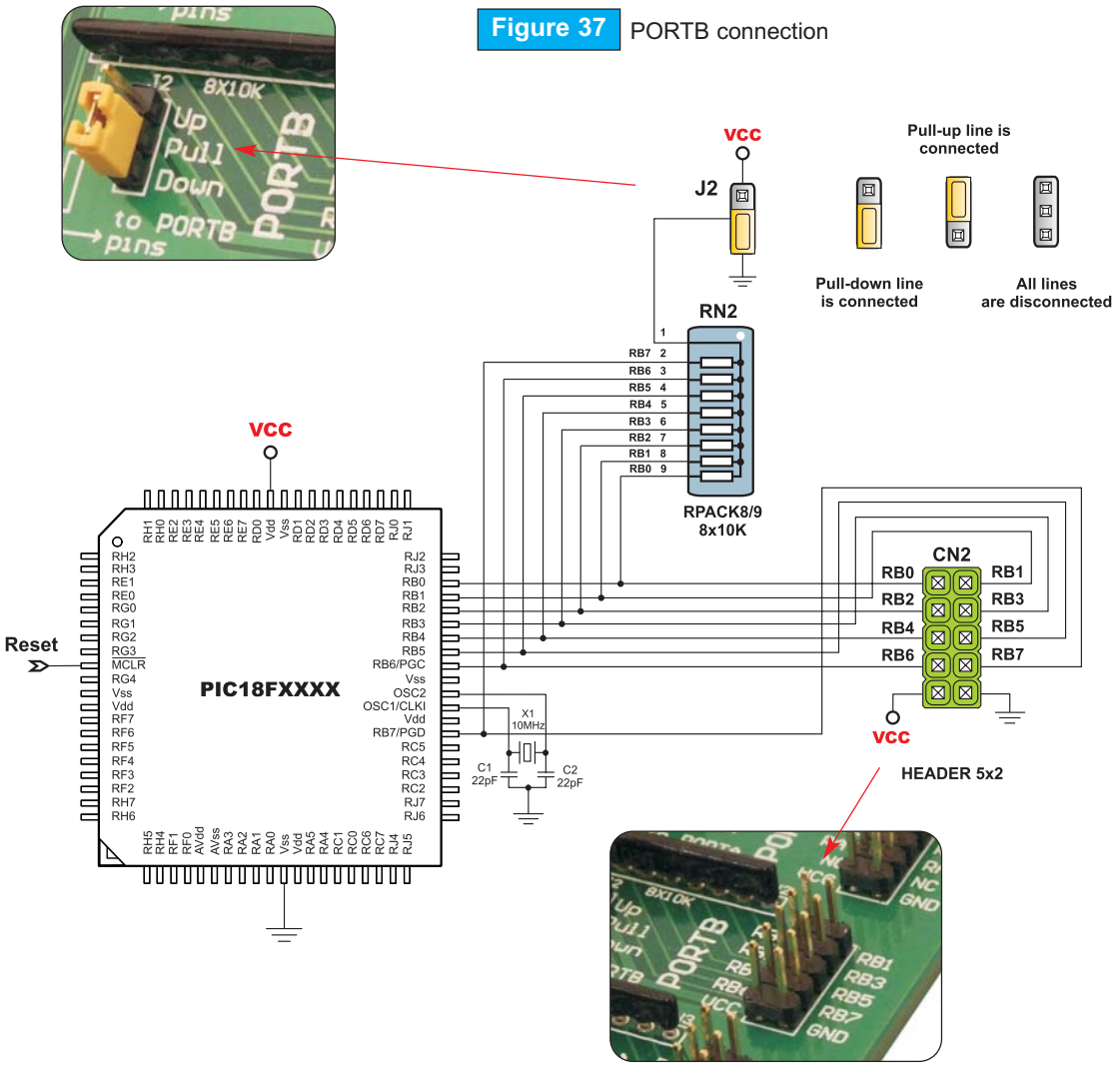


Figure 36 Flat cable connector

Figure 37 PORTB connection



MMC/SD (MULTIMEDIA CARD)

MMC card is used as a storage media for a portable devices from which it can be easily removed to enable data transfer to PC. For example, a digital camera uses MMC card for storing image files. Data can be easily transferred from MMC card to a PC using MMC reader. Modern computers, laptops and desktops usually have card readers with SD slots for reading MMC cards.

Microcontroller on the BigPIC5 development board communicates with MMC card via SPI communication.

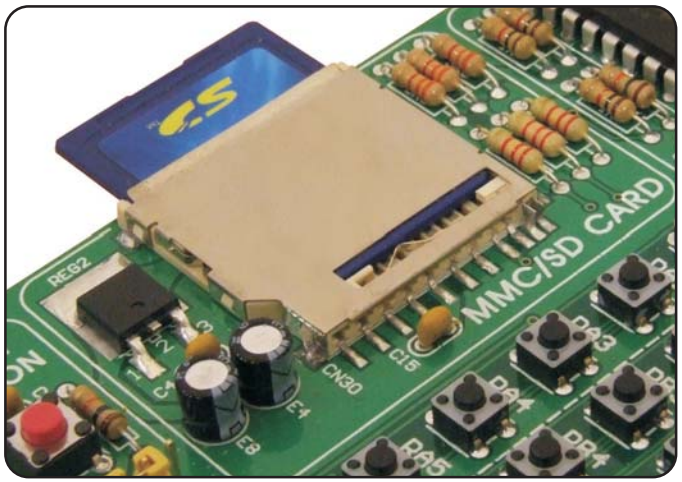


Figure 38 On-board MMC slot

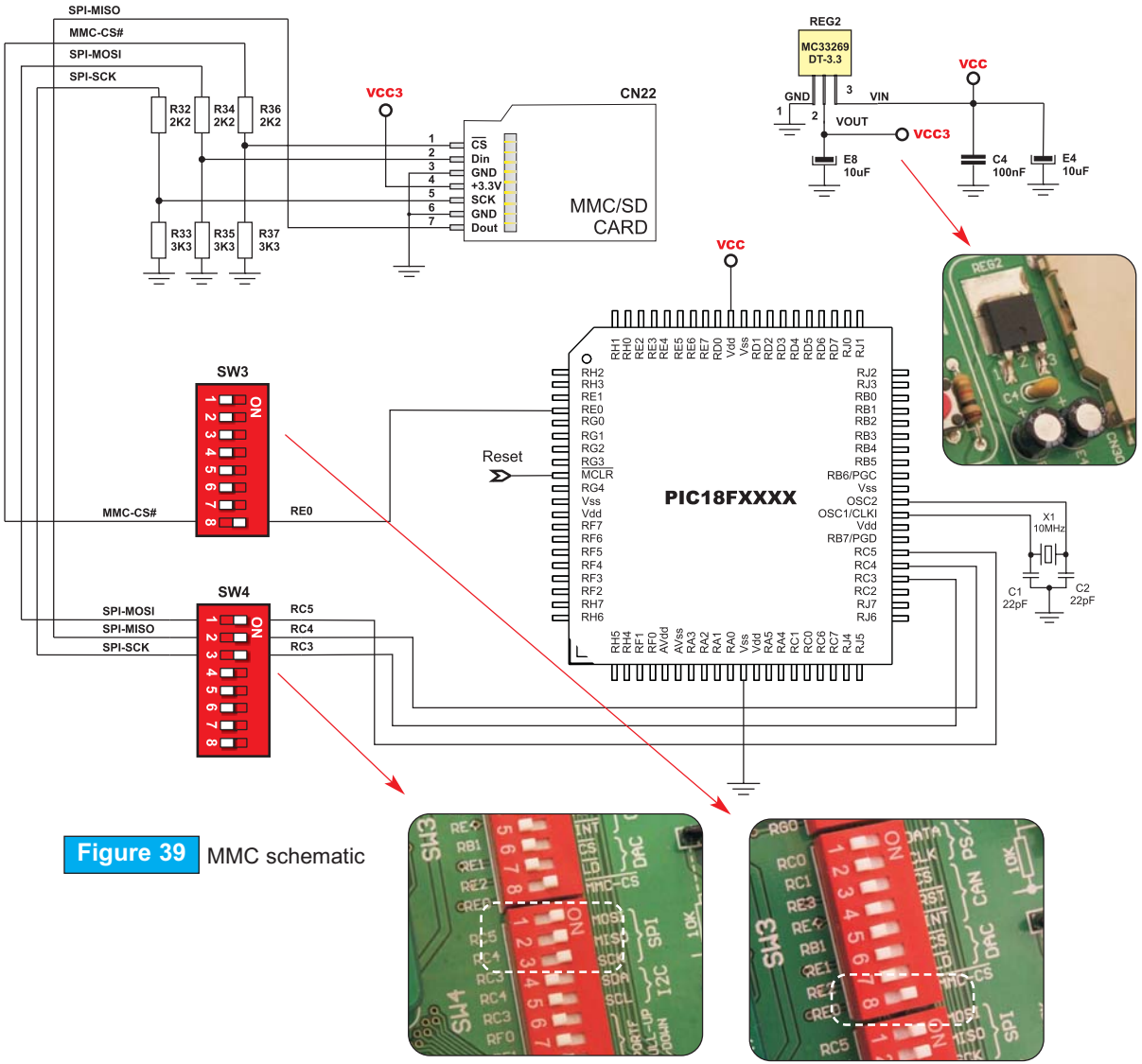


Figure 39 MMC schematic

To enable MMC card, switch 8 of the switch group SW3 and switches 1, 2 and 3 of the switch group SW4 must be turned ON. The BIGPIC5 power supply voltage is 5V DC, whereas the MMC card power supply voltage is 3.3V DC. Because of that, there is an on-board voltage regulator MC33269DT-3.3.

Voltage level on data lines connecting the microcontroller to MMC card must be limited to 3.3V. It is done by means of resistor voltage dividers as shown in Figure 39.

CAN COMMUNICATION

The BigPIC development system supports CAN communication which is, beside in the automobile industry, more and more used in other areas as well. Connection is enabled by means of two specialized circuits: High-Speed CAN Transceiver MCP 2551 and CAN controller MCP2510. The first one is used as interface between communication line and CAN controller. PIC microcontroller communicates with later circuit via SPI protocol. CAN communication system is enabled using switches of the switch groups SW3 and SW4. All marks needed are printed on the board beside the connector and the appropriate switches.

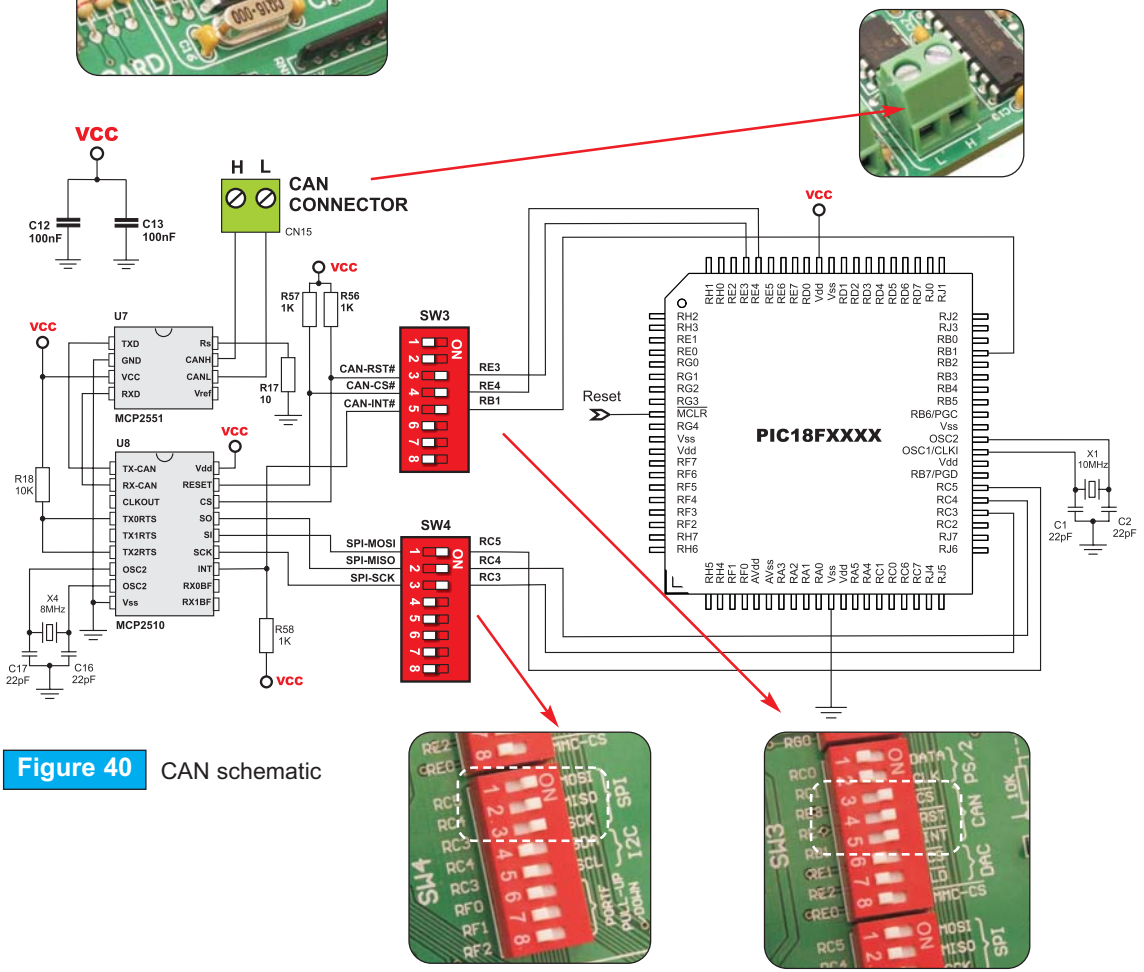


Figure 40 CAN schematic

RS485 COMMUNICATION

RS485 communication module enables high speed bidirectional data communication according to RS-485 standard, widely used in industry. Such serial communication is enabled by means of the ADM485 circuit, while this chip communicates with the microcontroller via USART communication. Serial communication lines are connected to the connector placed on the left side of the development board. Connection between the ADM485 chip and the microcontroller's pins used for USART communication is enabled by turning the appropriate switches of the switch group SW2 on. All marks needed are printed on the board beside the connector and the appropriate switches. Connection between the microcontroller and RS-485 serial communication module is shown on scheme below.

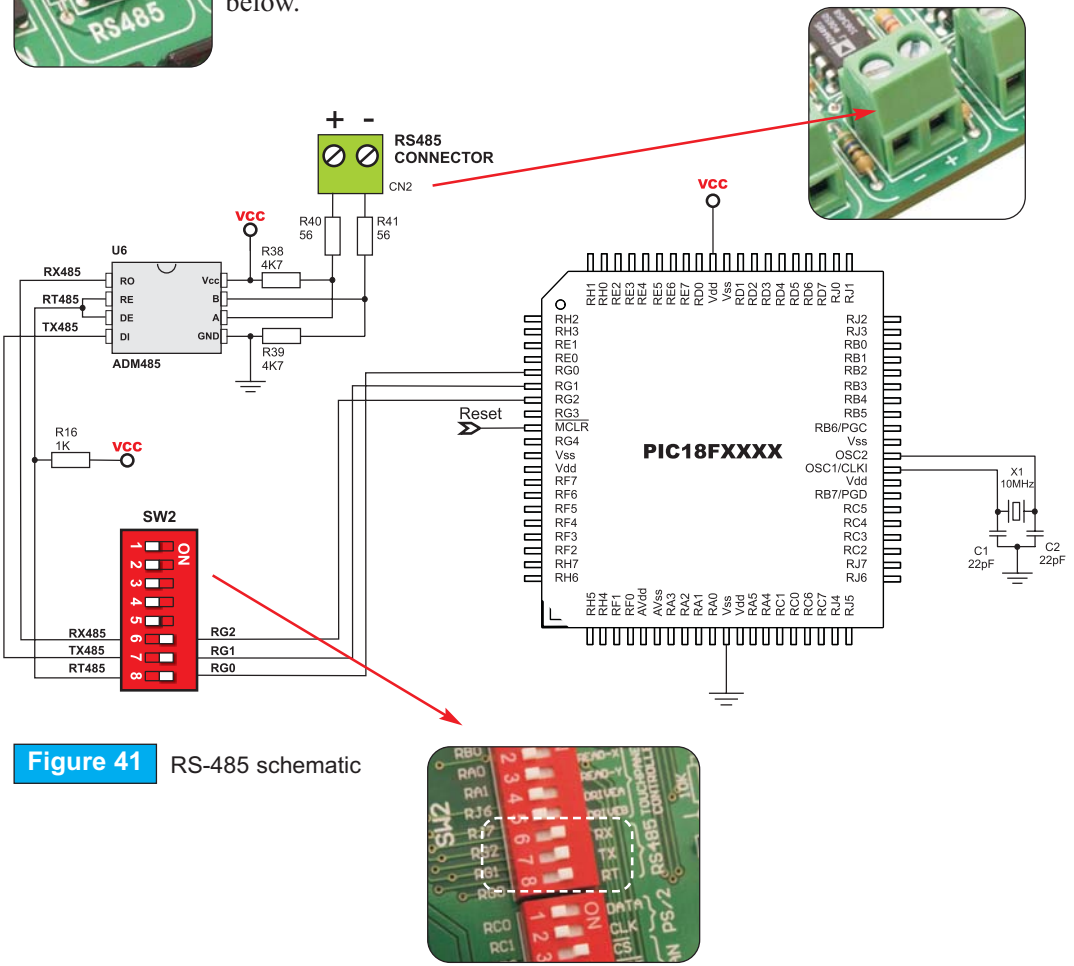
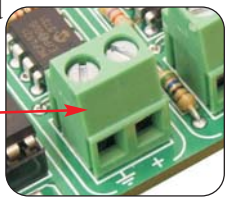
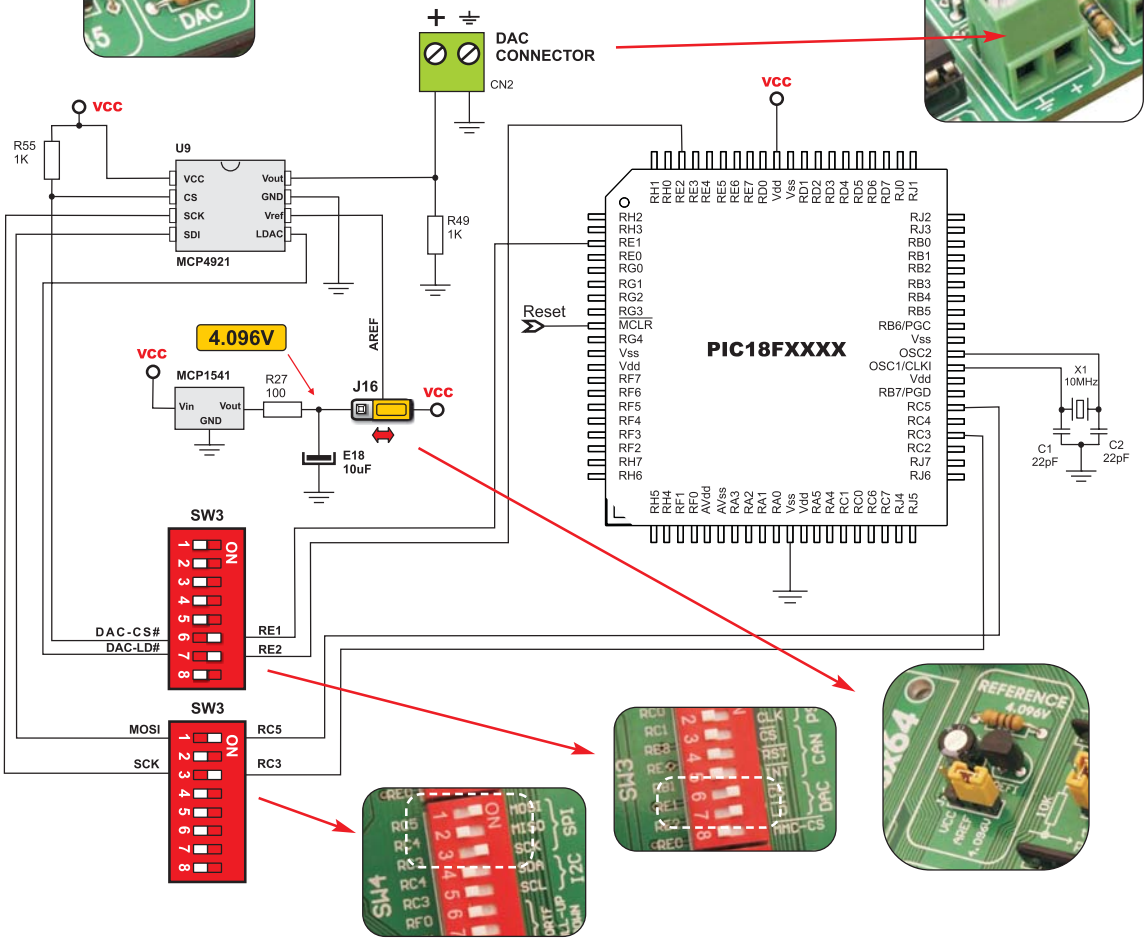


Figure 41 RS-485 schematic

D/A CONVERTER

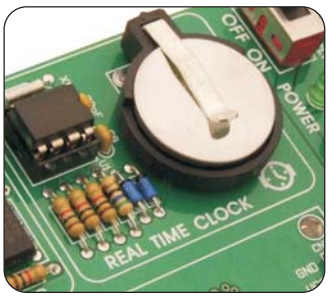
Most PIC microcontrollers do not have built-in D/A converter. To enable them to use digital-to-analog conversion, the BigPIC5 development system has on-board 12-bit D/A converter MCP4921. The microcontroller transfers data to be converted into analog signal via SPI communication. After conversion, the appropriate analog value appears on the connector placed on the left side of the development board. The BigPIC5 enables reference voltage selection for the operation of converter. It can be power supply voltage (5V) or 4.096V provided by precise voltage source reference MCP1541. The appropriate voltage is selected using jumper J16. The operation of converter as well as its communication with the microcontroller is enabled by switches of the switch groups SW3 and SW4.

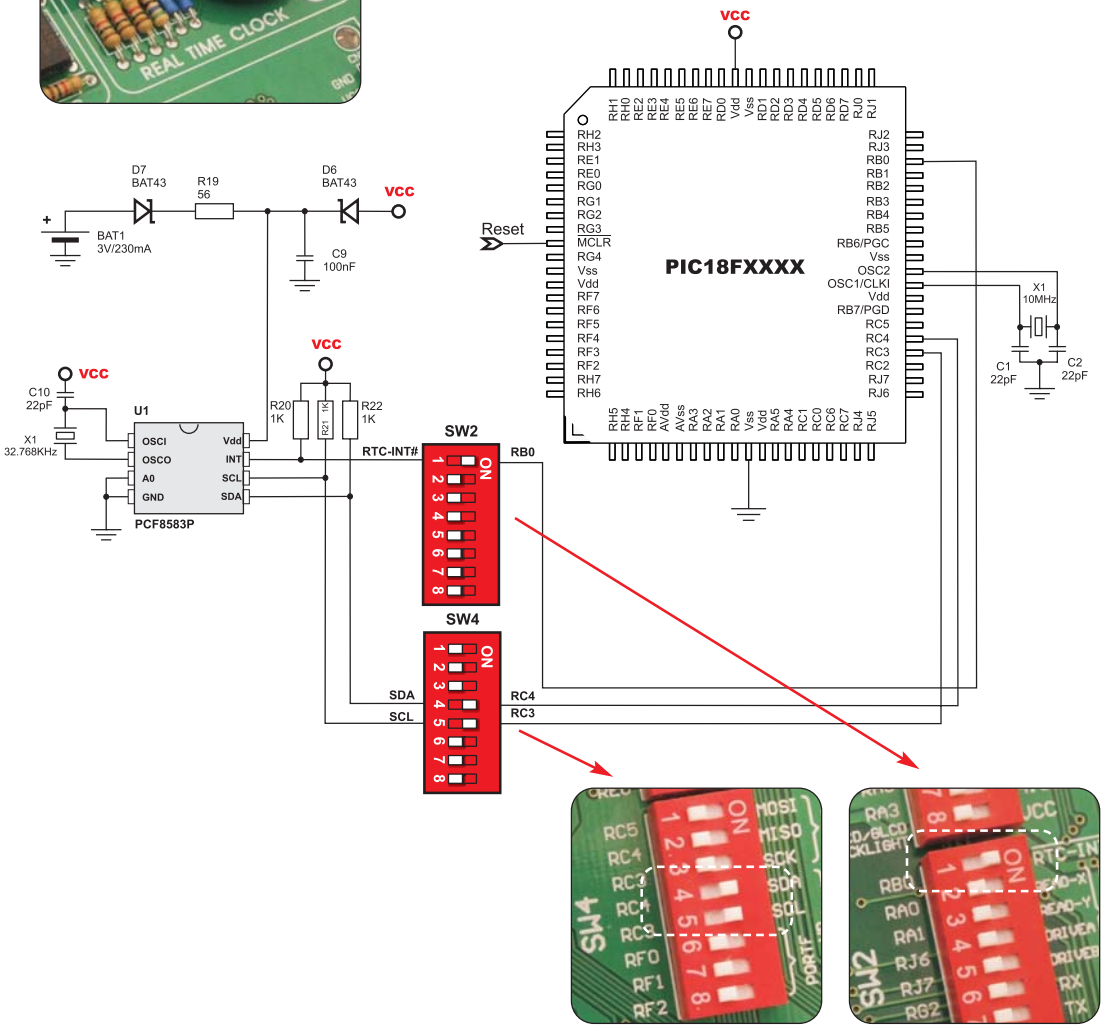




REAL TIME CLOCK

The specialized circuit PCF8583 is used as a real-time clock/calendar. Their setting as well as communication with the microcontroller is performed via I²C communication using two switches of the switch group SW4. This circuit enables programmed alarm to appear (0V signal). It can be applied to the RB0 pin through one switch of the switch group SW2. The voltage necessary for clock operation is provided by a standard lithium 3V button cell.

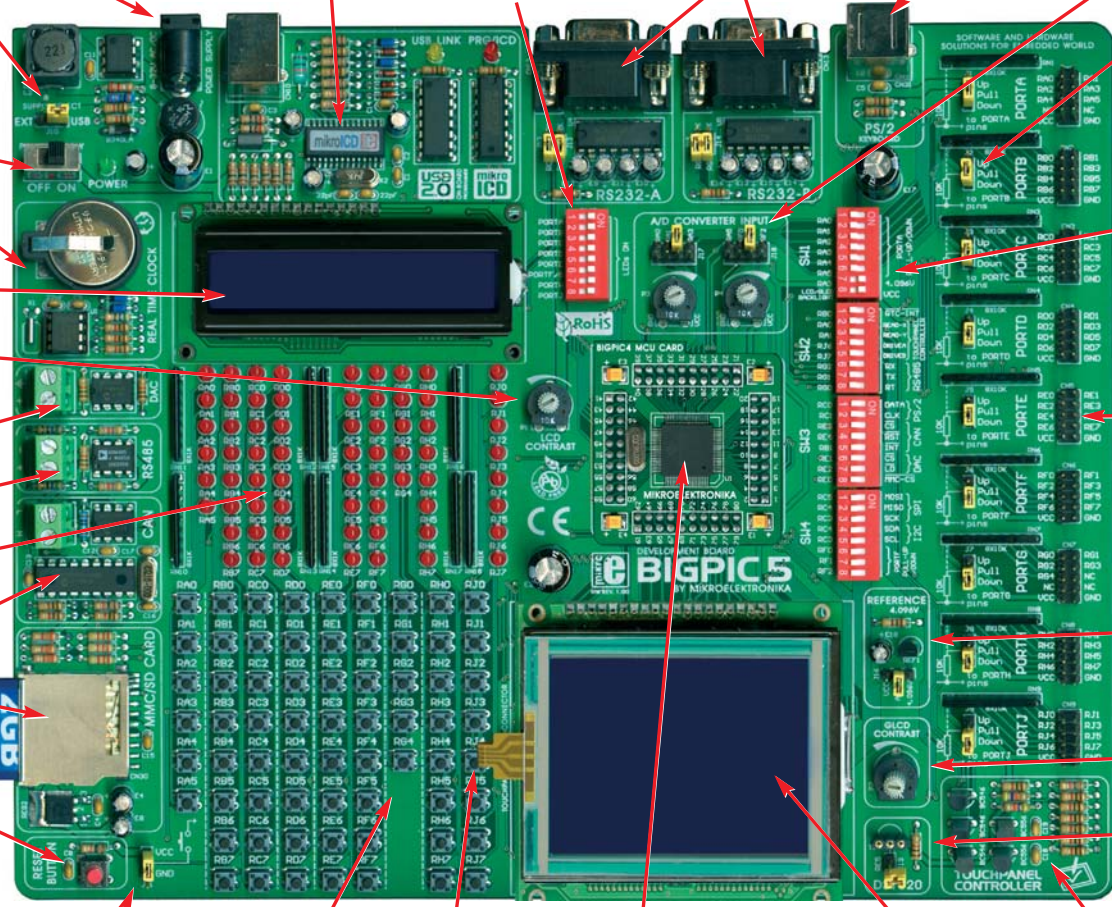




MikroElektronika

SOFTWARE AND HARDWARE SOLUTIONS FOR EMBEDDED WORLD

BigPIC5



External power supply of 8 - 32 V AC/DC.

USB 2.0 programmer.

Turn ON or OFF the LEDs on ports A, B, C, D, E, F, G, H and J.

Two RS232 modules with selectable TX and RX.

PS/2 connector.

Pins RA0-RA5 and RF0-RF2 can be connected to potentiometers P3 and P4.

Selectable external and USB power supply. When using USB port, there is no need for external power supply.

Power ON / OFF switch.

On-board real time Clock / Calendar.

16x2 character LCD display.

Potentiometer for LCD contrast adjustment.

12-bit D/A converter module.

RS-485 communication module.

67 LEDs for I/O pins state monitoring.

CAN communication module.

MMC/SD Multimedia Card slot.

Reset push-button.

Jumpers to determine input pin performance in idle state (connected to pull-up or pull-down resistors).

Switches in switch groups SW1-SW4 enables various on-board peripherals.

2x5 connectors for direct port access. Each port connector has additional VCC and GND pins.

4.096V precise reference voltage source.

GLCD contrast potentiometer.

DS1820 temperature sensor.

Jumper to select high/low state of pins on button press.

Push-buttons.

Touch panel Connector.

BigPIC5 MCU card supports 64 and 80-pin PIC microcontrollers.

Graphic LCD display (GLCD).

Touch panel controller.

None of the parts of this manual, including the product and software described in it, may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form or by any means, excepting the documentation kept by the purchaser for backup purposes, without expressed written permission of MikroElektronika Company.

Product warranty or service will not be extended if the product is repaired, modified or altered, unless such repair, modification or alteration is authorized in writing by MikroElektronika.

MikroElektronika provides this manual "as is" without warranty of any kind, either expressed or implied, including, but not limiting to implied warranties or conditions of merchantability or fitness for a particular purpose.

In no event shall MikroElektronika, its directors, officers, employees or distributors be liable for any indirect, specific, incidental or consequential damages whatsoever (including damages for loss of business profits and business information, business interruption or any other pecuniary loss) arising from any defect or error in this manual or product, even if MikroElektronika has been advised of the possibility of such damages.

Specification and information contained in this manual are furnished for internal use only, and are subject to change at any time without notice, and should be construed as a commitment by MikroElektronika.

MikroElektronika assumes no responsibility or liability for any errors or inaccuracies that may appear in this manual, including the product and software described in it.

Product and corporate names appearing in this manual may or may not be registered trademarks or copyrights of their respective companies, and are used only for identification or explanation and to the owners' benefit, with no intent to infringe.

MikroElektronika

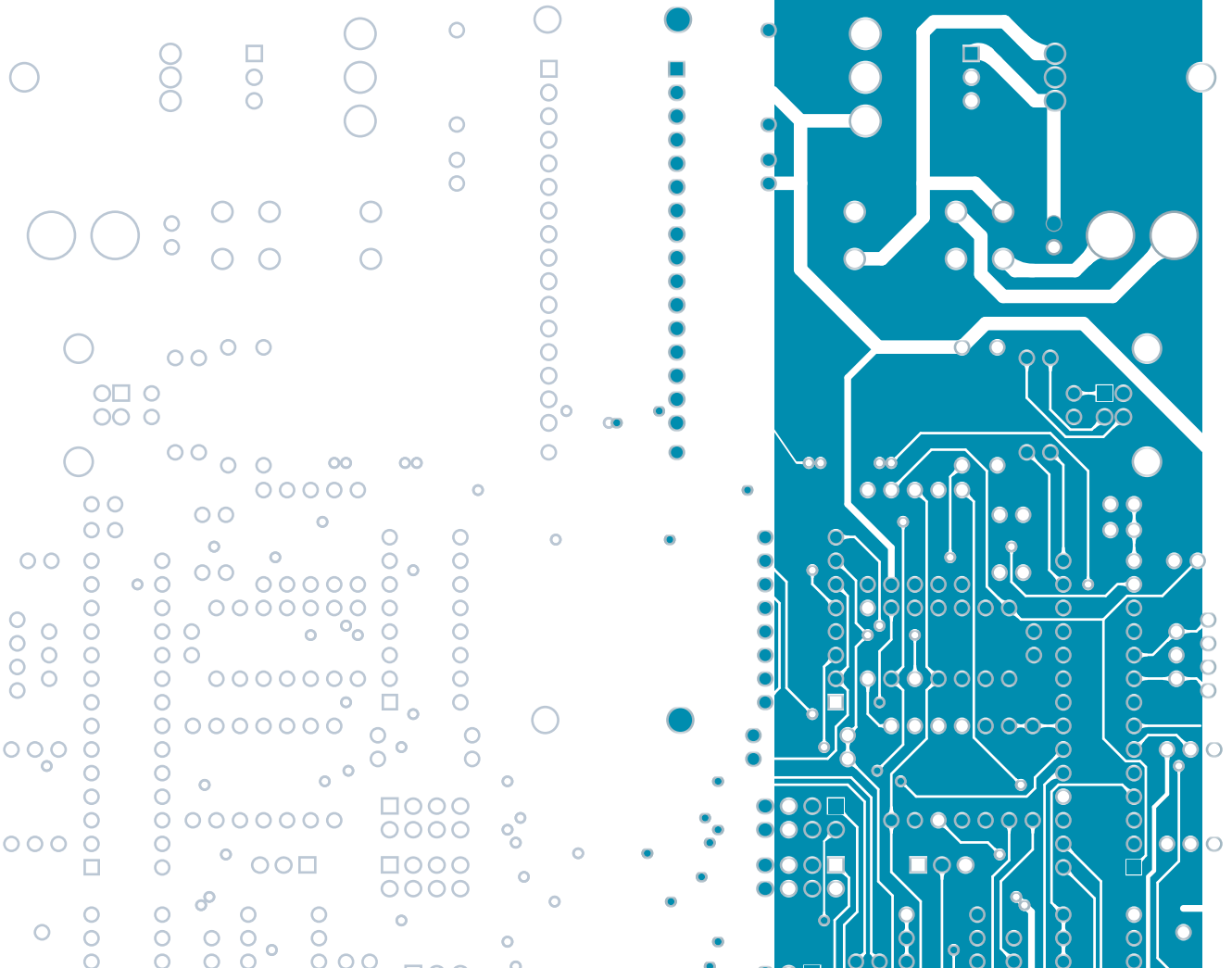
SOFTWARE AND HARDWARE SOLUTIONS FOR EMBEDDED WORLD ...making it simple

If you have any other question, comment or a business proposal, please contact us:

web: www.mikroe.com
e-mail: office@mikroe.com

If you are experiencing problems with any of our products
or you just want additional information, please let us know.

TECHNICAL SUPPORT: www.mikroe.com/en/support



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

mikroElektronika:
MIKROE-266